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ABRIDGMENTS OF SPECIFICATIONS.

CLASS 98, PHOTOGRAPHY.

PERIOD—A.D. 1867-76.

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EXPLANATORY NOTE.

The contents of this Abridgment Class may be seen from its Subject-matter Index. For further information as to the Classification of the subject-matter of inventions, reference should be made to the *Abridgment-Class and Index Key*, published at the Patent Office, 25, Southampton Buildings, Chancery Lane, W.C., price 1*s*., postage 6*d*.

It should be borne in mind that the abridgments are merely intended to serve as guides to the Specifications, which must themselves be consulted for the details of any particular invention. Printed Specifications, price 8*d*., may be purchased at the Patent Office, or ordered by post, no additional charge being made for postage.

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,, J. H. ...'72. 3125. '73. 3938. '74. 1718. '75. 1663 '76. 3298.
,, J. R...'69. 336 '70. 201
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Kukatzkay's, Seyss, & Co. ...'69. 3676

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Lambert, C. L...'74. 1634 3633. '75. 1825
Larauza, A. G...'67. 407
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,, E. P...'73. 1341. 1449
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Le Gros, E...'72. 2008
Lester, T...'74. 2617
Lewthwaite, J. ...'68. 3383
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Long, J...'73. 776

McCraw, W...'70. 941
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McDonald, T...'72. 2684
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Sarony, O. ...'76. 1991
Sawyer, J. R. ...'70. 3036. '74. 3740
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Shaw, G. ...'69. 806
Shuette, O. ...'75. 1865
Silva, W. d' ...'72. 2008
Silvy, C. ...'67. 2170
Simpson, J...'67. 1553
Sintzenich, E. R. ...'67. 3542
Siprell, D. W. ...'75. 246
Slater, A...'72. 1395
Slingsby, R. ...'75. 3352. '76. 4385
Smith, G. R...'72. 641
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Stahlschmidt, J. C. L...'74. 4011
Stein, S. T...'73. 1333
Steinheil, A. ...'74. 1124
,, *E.* ...'74. 1124
Stillman, W. J. ...'71. 3069
Sturgeon, T. ...'74. 2085
Sugg, W. T. ...'75. 3334
Syré, A. ...'76. 4473

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,, F. B...'70. 3131
,, T. L...'75. 3815
,, W. ...'68. 951
Tenac, C. L. van ...'73. 2347
Terpereau, J. A...'76. 4060
Teysonnière, A. ...'73. 3176
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Webber, C. E. ....*'73*. 686
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West, T. J..............*'75*. 2011
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White, O. C. ....*'67*. 2915
,, W. G............*'74*. 2085
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Williams. A. D. ....*'71*. 468
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Window, F. R....*'69*. 3049. *'70*. 2266. *'72*. 840
Wirth, F.................*'74*. 1124
Wise, W. L. ....*'69*. 3676
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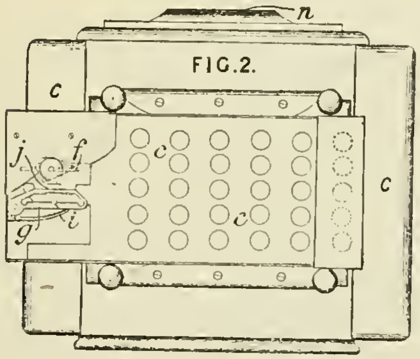
PHOTOGRAPHY.

Patents have been granted in all cases, unless otherwise stated. Drawings accompany the Specification where the abridgment is illustrated and also where the words *Drawings to Specification* follow the date.

A.D. 1867.

20. Helsby, W. G. Jan. 3.



Cameras ; dark slides ; shutters.—A large number of impressions are made closely together on one plate, the printed pictures being subsequently cut out of the sheet. The apparatus consists of a camera in which there is mounted the same number of lenses as of impressions to be made ; these lenses touch or are near to each other, and are fitted either to produce like pictures, or to produce pictures of different sizes and shadows. That an equal quantity of light may pass to every picture, a sliding shutter is so fitted in the object piece of the camera that it can be opened and closed in the same direction. The extra quantity of light allowed to enter through at one side of the object piece aperture, during the opening, is thus compensated by being shut off earlier in the closing movement. In Fig. 2, C is the plate frame, and *c* the sliding shutter operated by thumb-levers *f* engaging projections *j* on a spring piece *g*, which is locked by a pin *i* at the end of the movement of the shutter. When the first exposure is completed, the dark slide *n* is moved to bring into exposure the unexposed parts situated between the parts previously exposed. The operation of focussing may be facilitated by means of a plate with apertures of the shape of the pictures and at the proper distance from each other.

43. Doering, F. B. Jan. 7. *Drawings to Specification.*

Tripod stands for rock drills &c. Two of the legs are telescopic, and the third is composed of the two side supporting-shafts of the boring-engine, along which it moves as the work proceeds.

45. Ashton, R. H. Jan. 7. [*Provisional protection only.*]

Photo-mechanical printing.—Relates to means for producing printing-surfaces from photographs. A negative or positive is exposed to light in combination with sensitized gelatine &c. to form a gelatine mould from which a mould in soft metal is obtained by pressure. An intermediate mould of wax coated with plumbago may be made when necessary. The metal mould is used to produce an electrotype.

71. Morvan, A. G. Jan. 11.

Photo-mechanical printing ; sensitized films.—Relates to the preparation, by photographic methods, of transfers which may be transferred to a lithographic stone or to metal or wood to be etched or engraved to form a printing-surface. The paper, which may be albumenized, is dipped in sour milk, whey, or lactine, dried, and coated with a sensitive mixture of gelatine or glue and potassium permanganate. It is then exposed under a negative, which may be an ordinary photographic one or may be formed by tracing the design on blackened glass; before development the sensitive film is coated with a mixture of bitumen, wax, and pitch dissolved in essence of lavender. The paper is then dried in the dark, and immersed in water with the blackened side downwards. The water removes the unaffected gelatine together with the black coating, leaving the coating on the parts exposed to light. The print is then dried, and may be transferred to stone &c.

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174. Ross, T. Jan. 23.

Lenses.—Consists in the employment of different descriptions or qualities of flint glass or of crown glass for both the convex and concave glasses of the lenses, the convex being made of light flint or light crown glass, and the concave being made of heavy or dense flint, or heavy or dense crown glass.

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407. Newton, W. E., [*Larauza, A. G.*]. Feb. 13. [*Provisional protection only.*]

Studio accessories; producing photographs of special character.—Consists in the production of a photographic statuette, or portrait showing the back and the front of the person photographed. The person to be photographed is placed on a turntable capable of turning exactly through half a circle, so that the person is first seen and photographed from the front and afterwards from behind. The corresponding photographic pictures form two exact halves, which may be placed back to back. The edges of the two portraits are then stuck together except at the bottom, and the whole is expanded by introducing a piece of wood or other material into the interior. The photographic statuette is placed in a kiosque, which is composed of four, five, or more looking-glasses placed in connection with each other and ornamented with gilding, sculpture, or otherwise.

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659. Lake, W. R., [*Crosman, J. C.*]. March 8.

Sensitized films.—Relates to means for coating paper and other materials with fluids, for photographic and other purposes. The sheet to be coated is first thoroughly wetted, preferably by immersion in suitable fluid, which may be cold or heated. The sheet is then laid on a table, the top of which is by preference of glass; air and any free liquid are expressed from between the sheet and table by suitable manipulation, and superfluous fluid is removed from the upper surface by means of bibulous paper or other absorber. The sheet is then coated with the required fluid by pouring the latter upon it, the spreading being assisted in some cases by a brush &c. The sheet may be held in a frame provided with deckles.

732. Lee, E. March 13.

Mounting films; colouring.—To transfer photographs from paper to glass, metal, wood, &c., the photograph is varnished, and then waterproofed by applying powdered resin &c., which is fixed by passing the paper over a wet stone or between rollers, or by heat or by incorporating the resin with colours applied to the photograph. The photograph is then immersed in water, and the varnished or coloured side is laid upon the glass. Pressure is applied to the back by a burnisher or by india-rubber rollers. After drying, the paper is wetted at the back and removed, leaving the photographic image on the glass.

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793. Clements, J. M. March 19. *Drawings to Specification.*

Finishing.—Relates to pressing-machinery, primarily described for ironing garments and the like, but stated to be adapted for use by photographers. The pressing is effected by hollow rolls heated by gas jets or the like, between which the work is passed. The rolls are operated by worm gear, and their distance apart is regulated by a screw and a spiral spring.

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825. Hart, H. W. March 21. [*Provisional protection only.*]

Enamels; finishing; mounting prints and films; sensitized plates.—Indestructible photographic &c. pictures are produced on the surface of glass enamel with which a metallic plate is coated. The picture is burnt in by heating the plate until the enamel is softened and partially melted. The photograph may be taken direct on the enamelled surface; or a collodion film with the photographic image thereon may be transferred from its glass plate to the enamelled surface; or a negative, taken in the ordinary manner, may be printed on paper, transferred thence to the enamelled surface, and burnt in.

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849. Edwards, E. March 23. [*Provisional protection only.*]

Cameras; lenses; enlarging; printing; sensitized plates; developing; fixing; toning; washing.—A lens of very short focus and large aperture is fitted to a camera arranged to produce a negative or a succession of small negatives upon the sensitive plate. Different parts of the plate are exposed to the action of the light from the lens by means of an instantaneous shutter placed in front of the lens or behind it. For these negatives the sensitizing-bath is a silver bath of full strength and neutral or slightly acid. The developing-solution is sulphate of iron to which is added loaf sugar and alcohol. The fixing-solution consists of hyposulphite of soda. After fixing, the pictures are varnished. From these small negatives enlarged copies are printed by attaching the camera described above to the front of another camera. The distance between the negative and the lens and between the lens and the picture to be formed determines the size of the copy. A mixture of collodion with a solution of white wax in ether is poured on to the glass plate and rubbed off again to give place to the film sensitized in an acid bath. The picture is then taken in the second camera, and developed with a solution containing excess of acetic acid. The picture is fixed with cyanide of potassium, and toned with a solution of bichloride of mercury containing salts of gold or uranium. The film is washed with hyposulphite of soda solution and then dried. The dried picture is transferred to paper by immersion in water and by pressure.

Shutters ; vignetting.—The instantaneous shutter for use with the camera described above consists of a rotary plate with an aperture which can be brought opposite the lens. To produce vignette prints, masks are dropped into the aperture ordinarily occupied by the shutter of the dark slide.

947. Woodbury, W. B., and **Ashton, R. H.** March 30.

Photo-mechanical printing.—Transparent designs, pictures, watermarks, trade marks, &c. are produced upon paper by pressure from reliefs or intaglios obtained by photography. Also, by pressure from the said reliefs, and with the interposition of thin paper charged with a greasy substance and similar to the carbonized paper used in copying letters, a design is produced which may be transferred to stone for printing by the ordinary lithographic process, or the image may, by the same means, be impressed at once on to the stone without transferring. The relief is first obtained in gelatine by the process described in Specification No. 2338, A.D. 1864 ; it is mounted on a hard metal plate, and the paper to be impressed is rolled or passed through a press in contact therewith. The paper is rendered transparent at those parts which have been in contact with the raised parts of the design. This gives a positive picture by reflected light, and a negative by transmitted light. If the reverse effect be required, a transparent positive is used, in place of the ordinary negative, to produce the gelatine relief. Instead of the above method, a metal impression or electrotype from the gelatine may be used with the ordinary paper machinery to produce the watermark. In place of using the relief direct, a reverse thereof may be obtained, and casts of it may be made in gelatine on a steel or zinc plate which may be used for pressing the paper.

955. Higginson, G. March 30. [*Provisional protection only.*]

Sensitized plates ; positives, producing directly.—Permanent photographic pictures may be struck into the surface of china glass, porcelain, or any other enamelled surface, " without films," by applying certain chemicals, in various proportions, according to the nature of the article. The chemicals used are salts of uranium, pyrogallic, gallic, nitric, and citric acids, " cyanide, silver, iron, " and zinc."

968. Brooman, C. E., [*Disderi, A. A.*] April 1. [*Provisional protection only.*]

Photo-mechanical printing.—Relates to the production of relief or intaglio printing-surfaces from a photographic image. A sensitized albuminous or gelatinous coating has its unimpressed parts dissolved out, thus giving an image in relief. The surface is then varnished with gutta-percha, and a matrix or electrotype is obtained from this protected image in the ordinary way. The matrix is covered with an ink at the ordinary temperature, and applied to print on wood, glass, fabrics, paper, &c. After printing, the whole is allowed to dry, and the image is detached from the matrix by gentle heat. The ink may contain gelatine and colouring-ingredients. The matrix may be submitted to a second galvanic operation, and the resulting electrotype may be used for printing.

1526. Newton, W. E., [*Cook, H.*]. May 22. [*Provisional protection only.*]

Cameras ; change-boxes ; plate boxes ; stands.—A cylindrical box is made to contain fifty or other convenient number of prepared and sensitized glass plates, which are brought, by means of the simple rotation of the case, one after another, directly over a door, which opens and shuts automatically. A small camera like an ordinary opera-glass is fitted with two lenses exactly similar in focus ; one projects the image to be photographed on to the focussing-glass, which occupies the large part of the tube ; the other produces the image on the sensitized plate, which occupies a small dark chamber formed in the opposite tube. A number of sensitized plates are carried in a small cylindrical box having the shape of a drinking-vessel or otherwise. This box is pushed over an opening in the dark chamber of the camera, and a plate is dropped through a door in the box into the camera. When the view has been taken, the apparatus is turned upside down, and the plate which has been exposed falls back into the box, which is then removed. The door of the box closes automatically, and a small rotation of the box to the right or left brings another sensitized plate over the door and the opening in the camera. A stand for the camera consists of a socket and upright post provided with a universal joint which permits of the rapid fixing and removal of the camera.

1553. Simpson, J. May 25. [*Provisional protection only.*]

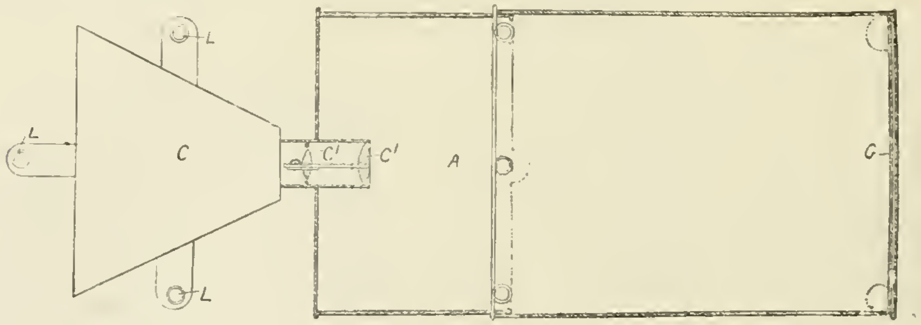
Enlarging ; printing ; cameras.—By means of this invention, enlarged photographic pictures may be obtained from small negatives; from such negatives positive prints may also be produced of better quality than those yielded by the ordinary methods. An ordinary photographic camera and lens are used in connection with a telescopic conical dark tube. The camera is connected with the dark tube, so as to have the lens enclosed and embraced by the narrow end of the cone, the base of the cone being provided with a slide constructed like the ordinary dark slide of a camera to receive a sheet of paper or other material previously sensitized. The ordinary dark slide of the camera, at the reverse end and outside the conical box, receives the negative to be printed from. The rays of light, entering the box, penetrate the negative, and, in their passage through the lens, become gradually enlarged until they are received by the sensitized surface at the base of the cone, the result of which is a direct enlarged positive print.

1593. Gage, F. B. May 29.

Developing.—For illuminating the shadows and harmonizing the lights and shades in photographic impressions, a partial development is effected in the camera by the aid of diffused light. The development is afterwards completed in the usual way, taking the precaution to reduce the strength of the developing-fluid with water. The photographic impression is taken in the usual way, and then some plain, dark, dead surface is placed in front of the camera, the sensitive surface still remaining in the camera, and being exposed to the light reflected from the dark surface, while the dark surface is kept in gentle motion. For a dark dead surface, a piece of thick black woollen cloth is attached, by one edge, to a stick. This is held horizontally and gently moved in front of the camera with the left hand, while the lens tube is uncovered with the right hand.

1676. Petrzywalski, J. June 7.

FIG.4.

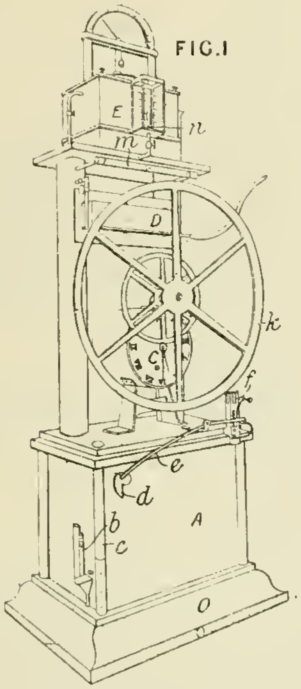


Cameras; copying documents, drawings, and the like; enlarging.—Relates to apparatus, described as a "camera obscura," for exhibiting on an enlarged scale carte-de-visite portraits, prints, lithographs or drawings, insects, and other objects, or for producing photographic negatives and positives from the same. The object is placed at the back of a pyramidal box C, and is illuminated by three lamps L, L, L, one of which is behind it. A magnified image is thrown by the lenses C¹, C¹ on a ground glass plate G at the end of a square box A formed of two parts, one sliding within the other. The rays of the three lamps are concentrated on the object by reflectors. The apparatus may be used for enlarging and for other photographic operations, by substituting a frame containing prepared paper or glass for the ground glass.

1684. Warburton, J., [*Friedleben, C.*]. June 7.

Photometers.—Relates to apparatus for recording the quality of coal gas. The gas enters the apparatus through a sensitive gauge D, Fig. 1, controlled by the indicator E, the water level in which governs the pressure in D. It then enters a meter in the case A, the water level in which is shown by the gauge *c*, and is regulated by the filling and drawing-off apparatus *b*. The overflow is received in the foot *o*. A cam *d* is driven by gearing from the drum of the meter. On this cam rests one end of a lever *e*, the short arm of which comes above the horizontal arm of a bell crank the other arm of which carries a weight *f* and a stem carrying a needle, made to puncture a disc of paper gripped between a disc *k* and a similar disc. The paper is revolved by clockwork C, and marked with divisions representing hours. It must be changed at each revolution, or the needle may be made adjustable so as to puncture the paper at different distances from the centre at each revolution. In working, the cam lifts one end of the lever and then lets it drop suddenly, when the released bell crank is acted on by a spring which shoots forward the needle through the paper; the needle is withdrawn by the weight *f*. In a modification, a pencil is used instead of a needle; each mark or prick represents a revolution of the meter drum. The gas escapes from the meter A, through a fine hole in the glass tube *m*, or a small opening in a disc of platinum, passing to the burner *n*. A thermograph is applied to the inlet pipe to register the temperature; and, to prevent the gas from being affected by air currents after passing through the small opening, it is led under water in a partially-filled closed vessel, whence it passes to the burner. The flame from the burner *n* burns between two scales, and, when the lighting power of the flame for a certain pressure and speed of flow of the gas is once ascertained, it is only necessary to read off the speed from the register and compare this with the height and breadth of the flame to find the value of the gas at any other time.

FIG.1

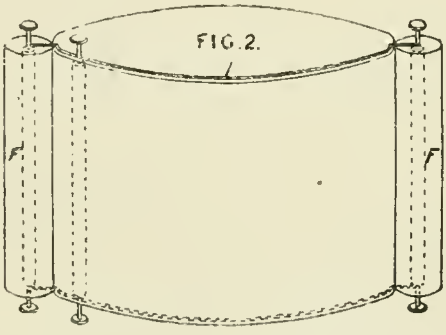


1994. Loewe, J. M. July 8. [*Provisional protection only.*]

Enlarging; developing; printing; sensitized films.—Relates to the preparation of canvas and other similar materials for enlarging, printing, and developing objects from negatives or positives obtained by means of photography. Linen, cotton, silk, &c., prepared by treating it with an aqueous solution of gelatine, or canvas prepared in the ordinary way for photographic purposes, by coating it with zinc or lead oxide, is further treated as follows:—Virgin wax is dissolved in essence of lavender, and turpentine is added. Three coatings are given to the fabric with this mixture. When the fabric is dry, it is rubbed with an aqueous solution made with iodide of zinc, potato, and pumicestone, and dried with a flannel till the surface becomes brilliant. For developing the picture on the fabric by sunlight, an aqueous solution is used that contains albumen, sodium chloride, ammonium chloride, tartaric acid, sodium carbonate, potassium iodide, ammonium iodide, potassium bromide, ammonium bromide, iodine, nitric acid, gold chloride, and sulphuric ether saturated with virgin wax. For enlarging by artificial light, more ammonium chloride and iodine are added to the above solution, together with magnesium, lithium iodide, and cadmium iodide. For printing in a pressure frame by contact, the first solution is diluted and sodium chloride and gold are added thereto.

2170. Silvy, C. July 26.

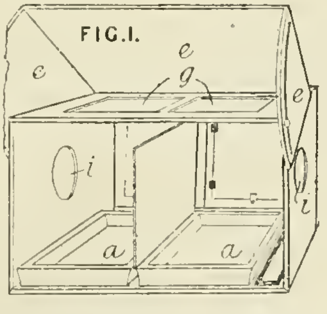
FIG.2.



Cameras; roller slides.—Rollers F from which sensitized paper can be unwound are so arranged in connection with a camera obscura that, by winding the paper round the frame I of the latter, panoramic photographs can be obtained.

2784. Gedge, W. E., [*Rochat, H.*]. Oct. 3. [*Provisional protection only.*]

FIG.I.



Dark rooms, portable. A portable laboratory, specially intended for photographic excursions, consists of a rectangular wooden case having a lid with an adjustable shade *e* opening from the front, and a smaller lid opening from the back. Openings *g* are fitted with yellow glass. The two sides and the front are pierced with round openings *i* to which are fitted sleeves which terminate in elastic wristbands. Two basins *a* are placed in the interior of the apparatus, one containing the sensitizing-bath, and the other the developing-bath. The dark slide, or frame for receiving the sensitized-plate, is introduced into the dark chamber by the back opening. The glass plate in the frame is taken by the hands in the sleeves and immersed in the silver bath, drained on blotting-paper, and replaced in the frame ; it is brought back into the apparatus after the pose, and the development is made in the second basin. The plate is afterwards withdrawn by the large opening in front, and the image is washed, fixed, and strengthened.

2844. Nelson, T. Oct. 9.

Photo-mechanical printing.—Relates to the preparation of the surfaces of paper or other material for drawing purposes, and to the application of the same to lithographic and other kinds of printing. The paper is laid on a sheet of copper or other metal prepared with a grained surface, and the two are passed between calendering or hot-pressing rollers ; or one of the rollers may have a grained surface, the plate being then dispensed with. The paper &c. is covered with a composition suitable for transferring drawings or designs to stone or metal, and is then impressed with the requisite pattern. The paper is then ready for receiving the drawing or design in chalk or ink for transferring. To produce surfaces in relief or intaglio from such drawings for printing, stereotyping, or electrotyping, an impression therefrom is printed on a surface of gelatine, gum, &c. in combination with the bichromates of potash, soda, or ammonia. The impression is then exposed to the light, and a printing-plate is produced from it in the manner described in Specification No. 887, A.D. 1866, or by other similar means.

2915. White, O. C. Oct. 17.

Head-rests for chairs. A telescopic rod B, pivoted at its lower end to a stud projecting from the back of the chair, is supported near its upper end by a bail D and an adjustable clamp C. The head-rest *b* is attached to the top of the telescopic rod by a ball-and-socket joint and clamp. The rod B may be non-telescopic ; also, its upper end may be curved so as to carry the ball joint very close to the head-rest. The head-rest is upholstered with a cushion raised on one side and two edges so as to leave a recess or hollow within the cushion.

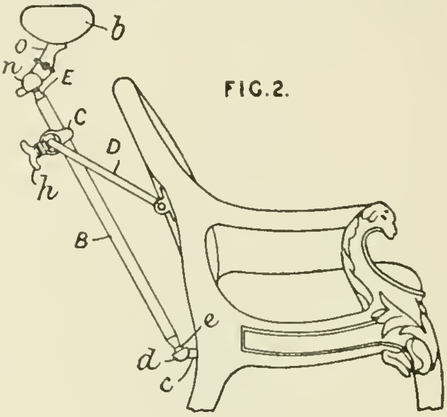


FIG.2.

3057. Piercy, F. Oct. 30.

Colouring.—A lithographic stone, wood block, or copper or other plate has its surface coated with the colour which is to be transferred to the photograph. A tracing of the photograph on paper is then laid on the surface of the stone &c., and the parts of the tracing corresponding to the parts of the photograph to be left light are rubbed or pressed so that the colour will be removed from the stone &c. at those parts. More colour may be removed from the stone by means of bread. The photograph is then laid face downwards on the stone, and passed through a press. A finely ground or ruled glass plate may be used in the above process instead of the lithographic stone. The invention also consists in transmitting rays through a lens from the photographic negative on to a tint, or on to the paper covering the tint, so as to place in proper position the colours or to remove colour, as in the above method. Oil colour may be applied to photographs to increase their permanence. A ground may be printed in oil colour on the paper, before or after printing the photograph, which can be worked upon with pencil, chalk, crayons, or oil or water colours. Albumenized paper may be charged with printing-ink, and the colour may be transferred to the photograph by pressure.

3484. Morrison, J. B. Dec. 7.

Tripod and like stands.—Relates to the contruction of a dentist's or other operating-chair the stand of which is provided with a form of universal joint which is applicable also to camera, telescope, and like stands. Three screws O, Fig. 8, extend downwards in a vertical or inclined position, and work in nuts *p* attached to supports *q*, which are jointed or hinged to the foot *a*. The upper parts of the supports consist of frames provided with bearings for the screws and jointed to lugs c^6 from the hollow hemisphere c^1, on which the body of the chair or apparatus rests. The screws may be operated simultaneously by pinions and bevel gearing. A piece c^2 rests on c^1, and a piece c^3 inside c^1 is connected to c^2 by a tightening-screw c^7, which is preferably operated by bevel gearing V, W. The dentist's chair shown in Fig. 2 is supported by slides d attached to a piece c^1 in a cup c^2 fixed to a heavy foot a. The bolt c^* passing through the piece c^3 is jointed to a lever c^4 formed with a cam c^5, so that, when the lever is raised, the bolt is slackened and the chair can be adjusted.

FIG. 8.

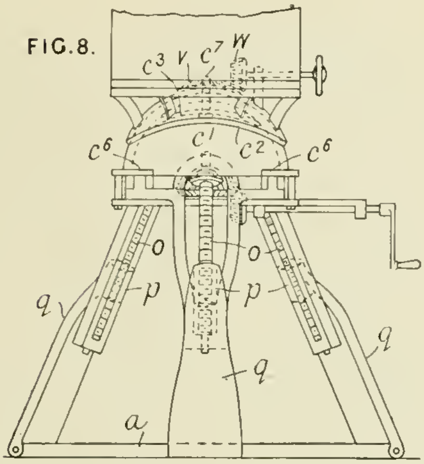
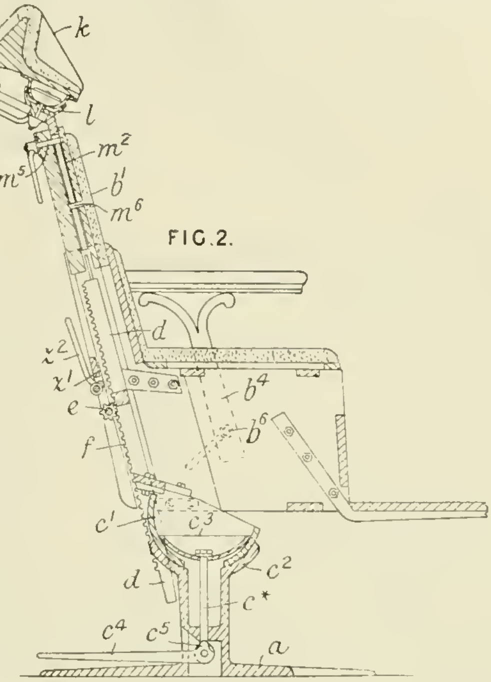


FIG. 2.

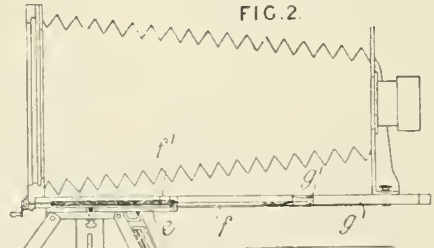


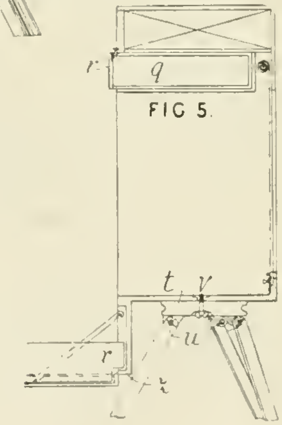
3542. Sintzenich, E. R., [*Reed, D.*]. Dec. 13. [*Provisional protection only.*]

Sensitized films; printing-paper.—Relates to the preparation of a material applicable as a substitute for collodion for photographic films or printing-sheets, from india-rubber, gutta-percha, Honduras gum, or other similar gums. The gums are dissolved in benzol, and purified by addition of alcohol. The gum is separated and rises to the surface in the form of a curd, which for fine work may be redissolved in benzol. One part of the curd is dissolved in benzol, and another part in carbon bisulphide, and the two solutions are mixed. The solution may be thickened by evaporation.

A.D. 1868.

363. Domenech, J. M., and **Jonte, F. P.** Feb. 3.





Cameras; dark rooms and developing-tents.—A portable apparatus for out-door use is in the form of a box or package which can be carried on the back by straps. When the apparatus is to be used, the box is fixed on a tripod, which is carried separately, and is then opened, the sides are folded outwards, and a flexible cloth is unfolded to cover the entire apparatus as well as the operator and form a dark tent, light being admitted through a coloured glass. The body or central portion of the box forms the camera, with an extensible bellows, and the folding sides are formed with recesses for chemicals, a water receptacle, and waste tray and all materials and apparatus necessary for developing and fixing the plates. A stock of plates is contained in a recess above the camera. A water supply valve, fitted to the flexible supply tube for washing the plates, consists of a clip with an elastic spring, which is released by the pressure of the finger and thumb when the flow of water is required. The camera may be used without the dark tent in some cases, its form being modified as shown in Fig. 2. The baseboard consists of three pieces *e*, *f*, *g*, the piece *e* being screwed upon the tripod, and the others *f* and *g* being adapted to telescope into the piece *e*, by the action of a screw, engaging nuts f^1 and g^1 on the sliding parts. The box may be attached to the tripod head by three adjustable clamps, or by a single central bolt *v* as shown in Fig. 5.

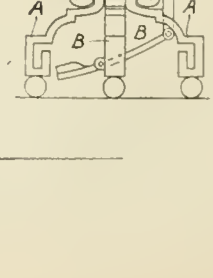
Plate boxes.—The plate box *q*, Fig. 5, is fitted with a hinged door *r*, which is opened by a spring of india-rubber when a spring-hook fastening is released by a pressure of the finger.

Developing; trays. — The developing-tray *z*, Fig. 5, is made of ebonite, and may be fitted with removable ebonite sides *x*.

Tripod stands. — The legs of the tripod are telescopic, and their upper extremities are formed with open slots so that they can be readily attached to or removed from the bolts *u*, Fig. 5, which are permanently fixed to the tripod head *t* secured to the camera case.

951. Taylor, W., and **Taylor, C. E.** March 20.

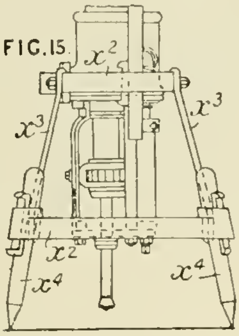
Stands.—The frame of a stand, which may support a table top for garden or restaurant use &c., or may be shaped to receive a lamp, vase, or other receptacle, consists of two metal parts A and B, which are adapted to be fitted together by passing one over or through the other, and are secured together by one or more rings C bolted round them.



1183. Lake, W. R., [*McKean, J. A.*]. April 8.

Tripod and like stands.—Relates to stands, with three or more adjustable legs, for rock and other drills. The stand consists of pieces x^2 bolted to standards x^3. The lower piece is provided with holes at the angles for the insertion of steel-pointed adjusting-pins x^4. The trunnion of the motor cylinder fits in a hole in the upper piece.

FIG.15.



1185. Beningfield, E. April 8. [*Provisional protection only.*]

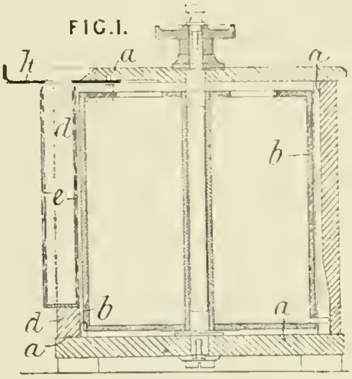
Tripod stands.—Relates to a portable fire-escape applicable also as a tripod stand for supporting staging &c. Three legs of metal tubing, hinged near their centres, are connected by pins to a crown plate. A pin on each leg takes into a hole in the plate, and prevents the legs from being spread out too far. When used for scaffolding &c., planks or platforms are suspended from the crown plates of two of the stands.

1206. Brooman, C. E., [*Marion, A.*]. April 11. [*Provisional protection only.*]

Chromo-gelatine processes; sensitized films.—Relates to a carbon process. The collodion film used is prepared with collodion and castor oil. The image from a negative picture on glass is transferred to a collodion film. This is done by spreading the film on the glass, allowing the excess to run off, and drying. The film, together with the image which it bears, is then raised from the glass, a positive picture on the collodion film being thus obtained. Gelatinized paper prepared with carbon is made by spreading upon paper a regular layer of gelatine coloured black. This is sensitized by means of a solution of potassium bichromate, and the coloured side is applied to the collodion film obtained as described above. When the paper has been exposed to light for the requisite time, it is cleansed by means of water; the water also causes the gelatine to swell, and the image to appear in relief upon the black layer of gelatine. This image is then transferred to albumenized paper. The albumenized paper is floated on its back on water, and the layer of black gelatine is placed upon the albumen. The two sheets are then lifted together, and pressed between plates of glass for an hour or two. The two papers are hung up to dry, and submitted to the action of steam in a closed box. The steam coagulates the albumen, and leaves the gelatine soluble. The two papers are then put into hot water, and separated. The albumenized paper retains the image, which is visible and "doubly "unalterable."

1297. Bing, L. April 21.

FIG.1.



Actinometers.—The light is caused to fall on a surface in such a way as to produce a graduated series of shades which are defined by a graduated figured scale. A sheet of photographically-sensitive paper is applied to the surface thus lighted for a determinate time; a graduated representation of the progressive change of tone from light to darkness is thereby obtained. By this arrangement the photographer is enabled to expose his plate or printing-paper for the time requisite to produce determinate results. The form of apparatus preferred consists of a dark box *a* in which is mounted, on a vertical axis, a cylinder *b* to receive a sheet of sensitized paper. The paper is secured to the surface of the cylinder by springs. One side *d* of the box is movable, and has a vertical slit cut in it. In the slit is mounted a glass tube *e*, of square cross-section, having three sides of yellow glass, and the fourth side of transparent glass with the above-mentioned scale marked thereon. The movable side is pressed against the cylinder by springs. The top of the tube has a horizontal slide *h* for shutting off or admitting the light. The light admitted to the tube acts on that portion of the sensitized paper which bears against the transparent side of the tube. The cylinder can be rotated, so as to receive successive impressions, and the impressions may be compared with one another. The graduated scale is produced by geometrical projection, upon the supposition that the light falling on the horizontal section of the top of the tube is of equal intensity in every part. Instead of a single tube, a series of tubes varying in length or diameter may be used, or "hollow or "solid bodies of the form of the parabola, ellipse, "hyperbola or sphere, or of any other suitable "form whereby determinate graduations of shades "may be produced."

1499. Henderson, A. C., [*Fournier, O. V.*]. May 7.

Photo-mechanical printing.—Relates to means for obtaining a grain or hatching capable of retaining the printing-ink on plates for heliographic engraving. A photographic proof is first taken on glass of the hatching required, which has been previously printed or traced on any surface. The hatching may be square, lozenge, dotted, or otherwise. A positive photograph is then printed on glass of the object to be reproduced. These two photographs are placed one on the other, so as to touch, and from them is printed a negative picture. From the latter picture is obtained, by the ordinary means, a heliographic plate. A similar but less satisfactory result may be obtained by taking, in two different positions, the image of the grain or hatching and the object itself on the same plate.

1512. Husband, W., and **Doering, F. B.** May 8.

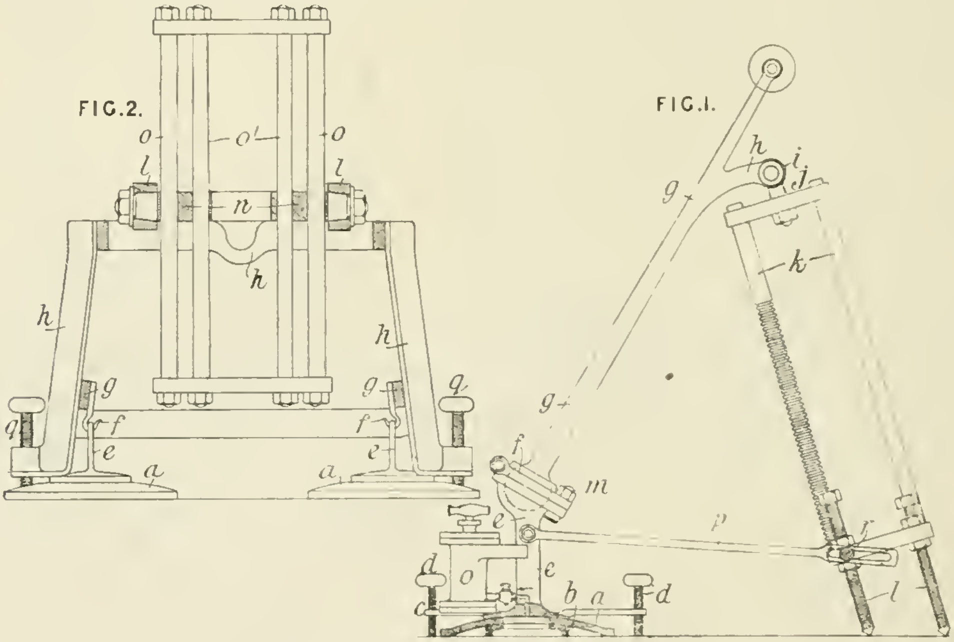


FIG.2.

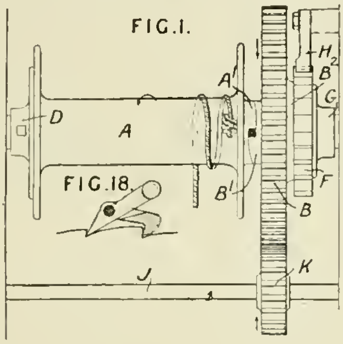
FIG.1.

Tripod and like stands.—Relates to frames or supports for rock boring or excavating machines. The leather, rubber, or other airtight disc *a*, Fig. 1, which is secured between the plates *b* and *c* of smaller diameter than itself, is placed on a layer of clay, when the ground is uneven. The plate *c* is formed with projecting pieces to receive the adjusting-screws *d*, and also with a central stem *e* to which the air pump *o* is attached. The arm *g* is connected to the stem *e* by the ball-and-socket joint *f*, and to the upper part is attached a rope pulley for lifting the machine with. Also from the lug *h* on the arm *g* the cross-bar *j* is supported by the joint pin *i*, and to it the rods *k* are attached. These support a lower cross-bar into which the adjusting screws *l* are tapped. The stay-rod *p* is bolted to the stem *e* at one end, and at the other is formed with a slot to suit different inclinations of the rods *k*, and the screw *r* secures it when in position. When the air is exhausted from below the disc *a*, either by the pump *o* or by condensed steam, the machine is fixed by clamping the joint *f* with the screw *m*. In the arrangement shown in Fig. 2, a disc *a*, as before described, is employed, and the upper plate *e* is supported from the uprights *h* by the cross bars *g* and the hooks *f*. The circular frame *l* is supported by the uprights *h* and bearings are formed in it to receive the trunnions of an inner ring. This is similarly formed to receive the cross-shafts *n*, and this arrangement admits of the bars *o*, o^1 taking up different inclinations. By raising the supports by the screws *q*, a vacuum is formed beneath the disc *a*, and the machine is secured thereby. For shaft-sinking, the supports consist of the adjusting-screws *l*, Fig. 1, rods *k*, and cross-bar *j*. The latter is connected by two arms and a ball-and-socket to a pair of overhead beams.

1532. Webster, W., and **Barnes, R. W.** May 11. [*Provisional protection only.*]

Head-rests &c.—The stem of a head-rest and waist-rest is mounted on a sliding-block which can be moved on a horizontal bed-plate by means of a rack and pinion or screw. A bar, to which the calliper supports or rests are attached, telescopes in a groove in the stem, and can be fixed at any height by set-screws &c. The rests are attached by a sliding piece and hinge so that they can be adjusted as desired. The horizontal bed-plate and sliding block for supporting the stem may also be employed with ordinary rests.

1867. Weston, T. A. June 6.



Stands.—The frictional gear described below as applied to a crab or winch may be applied to stands having rack-and-pinion elevating-gear for cameras &c. requiring to be sustained in any position when the lifting-handle is liberated. On the shaft are secured a collar D and ratchet-wheel F. The latter is prevented from moving endwise by a collar G, and from turning backwards by a pawl H. A winding-barrel A and spur-wheel B are mounted loosely on the shaft, their contiguous faces having inclined or screw paths A^1, B^1 in contact with one another. The wheel B bears against the wheel F, and its boss B^2 is of larger diameter than the inclined faces. A pinion K, on a shaft J, squared at the ends to receive handles, gears with the wheel B, and, when it is turned to lift a load, the inclined faces, which have a slight play, ride over each other until the barrel A and wheel boss B^2 are jammed against the collar D and wheel F respectively, when lifting commences. When the handle is turned to lower, the handle can only follow the wheel B, and if the movement is stopped the load will at once jam the barrel and wheel, and will be held by the pawl H. The inclined faces, ratchet-wheel, and collars may be fitted to the pinion shaft. The friction surfaces may be of metal, if lubricant is used; otherwise one should be of iron and the other of wood. By introducing between the friction surfaces discs such as described in Specification No. 263, A.D. 1863, a small amount of end pressure suffices to couple the parts, and the strain on the collars and shafts is reduced. The ratchet-wheel F may be made with internal teeth. A double pawl, as shown in Fig. 18, may be used. The distance between the ends may be the same as that between the teeth, so that both act simultaneously, or the distances may vary, in which case the ends are in operation alternately.

2104. Smith, J. A. July 1. [*Provisional protection refused.*]

Lenses.—Inaccuracies in photographic images caused by the divergent rays from the lens striking the sensitized plate at different distances from the focus of the lens are corrected by inserting a lens or lenses between the focus of the camera lens and the sensitized plate, and thereby, "or by other "optical means and appliances suitable for that "purpose," redirecting the actinic rays into parallel rays.

Producing coloured photographs; cameras.—A diaphragm with a small aperture is inserted in the camera, to intercept those actinic rays which do not converge to or pass through the focus, thereby securing the actinic efficiency and homogeneous purity of the coloured rays proceeding from the object photographed, with a view of producing a coloured image of the object.

2201. Edwards, E. July 13.

Chromo-gelatine processes; printing; sensitized films; producing coloured photographs.—A coating of bichromatized gelatine colouring-matter is applied to a surface of paper &c., and an image is obtained upon it by means of light under a photographic negative. To the surface bearing the image is applied a sheet of paper or other material prepared with gelatine, albumen, &c. which is rendered insoluble and adhesive. The parts of the sensitized gelatine and pigment not acted on by light and therefore remaining soluble are washed away, together with the paper &c. that originally carried the sensitive film, leaving the picture adhering to the insoluble paper. The picture is in this case reversed, but, if a direct picture is required, the negative is first transferred from its glass plate by producing on its surface alternate films of india-rubber and collodion till a sufficient strength has been obtained. These films, together with the negative, are then removed, and the prepared gelatine is printed upon from their reversed side. In other cases a mirror or lenses may be used for printing. Or the sensitized gelatine, together with the alternate films, may be mounted on the insoluble prepared paper. In the preparation of the pigmented paper, carbon, earths, and aniline, or other dyes may be used, and also finely-divided glass of various colours. Collodio-chloride of silver paper is prepared, by pouring the collodio-chloride on to a glass plate, applying the transfer paper to it, and removing them together from their support. Iodides or chlorides may be added in the preparation of the transfer paper, which is used in place of albumenized paper.

Enamels.—Enamels are produced in a similar way, vitreous colours being substituted for the ordinary colours, and the print being placed on the surface on to which it is to be burnt.

Enlarging.—The Provisional Specification states that in enlarging by exposing sensitized gelatine to the image obtained by passing rays of light through a negative, the ordinary position of the negative is reversed, and the enlarged picture is transferred to the adhesive paper as described above; or the gelatine may be printed upon through a glass plate on which it is mounted, the picture being afterwards mounted on the adhesive paper and removed from the glass.

Photo-mechanical printing.—Pictures in relief, from which electrotype or other moulds for printing or other purposes can be made, are produced by the method described above, the colouring-matter being omitted.

2280. Raine, J. July 20. [*Provisional protection only.*]

Cameras; lens fittings.—Relates to apparatus for obtaining panoramic pictures. The camera is divided into two or more equal parts by a division constructed to produce a picture with a soft or vignetted margin. After one view has been obtained, the camera is turned on its support so as to cause the margin of the second picture taken to unite with that of the first. A panoramic view is thus obtained by the junction of the several pictures. The division or divisional partition is a band with serrated edges, passing over two pulleys, one at the top and the other at the bottom of the camera. The width of the band is adjusted so that, when a lens is fitted into each division of the camera and a sensitive plate is exposed, when the camera is pointed at any uniform body, the serrated edge of the band (which must be moved by means of a handle attached to the axis of one of the pulleys over which it travels) will soften the edges of each picture so as to produce a continuous effect of lighting. When portraits are to be taken, the division may be removed, and, instead of having a separate lens to each division, one lens only (fitted on a sliding front) may be used.

2349. Hogg, J. A. July 27. *Drawings to Specification.*

Lamps, actinic.—In an incandescent gas burner on the Bunsen principle, described as adapted to ordinary lighting purposes, mixed air and gas pass through a perforated or gauze plate to a combustion chamber of woven platinum or like wire, which is rendered incandescent. It is stated that the plate "can be removed when actinic light is "required for photographic or other purposes."

2391. Davies, G., [*Réaulx, H. de F.,* and *Barret, A.*]. July 30. [*Provisional protection only.*]

Photo-mechanical printing.—Relates to a process for obtaining heliographic plates for printing. Behind a positive or negative of the object to be reproduced is placed a sheet of glass marked with a design which gives, by transmitted light, the appearance of hatching or grains. A photograph is then taken from this double plate by transmitted light. Or a photograph of the hatching may be placed behind the photographic plate to be reproduced. The photograph, with the grain and the picture on it, obtained in this way is covered first with a very thin coating and then with a thicker one, of bichrematized gelatine; the thickness of the latter coating depends on the amount of relief to be obtained. After desiccation, it is exposed to light, and then immersed in water. The picture is represented by reliefs and depressions. The gelatine is then removed, and transferred to another flat surface; to facilitate this operation, the gelatinized plate is immersed for some time in tepid water, to which glycerine or sugar is added. The gelatinous surface is then metallized, and an electrotype obtained from it; the electrotype forms the printing-surface.

2498. Fruwirth, D., and **Hawkins, A.** Aug. 10.

Photo-mechanical printing.—From a photographic negative, a positive picture is produced on a copper plate sensitized by a paste of potassium bichromate, sodium thiosulphate, and ammonium chloride together with albumen, gelatine, and Nuremberger or French glue. The unaltered bichromate is dissolved out by a mixture of methylated spirit and acetic acid. A faint reversed impression is left behind, which is capable of being transformed into a surface in relief by means of a process resembling the glyphographic process. Instead of copper plate, a plate of glass or ebonite may be used. In this case the sensitized solution contains gum, gelatine, Nuremberger glue, potassium bichromate, and oxalic acid. The unaltered bichromate is dissolved out with cold water. In making a cast from the reversed impression, the high lights may be built up with wax or varnish. The plate is then allowed to swell in water, and dry. The surface is brushed over with a solution of ox-gall, and coated with a composition containing sulphur and tar, to which may be added india-rubber and gutta-percha. From the plastic mould thus obtained a stereotype cast in intaglio in metal may be taken; or a cast may be taken in plaster of Paris. In obtaining a surface for printing by a letterpress machine, the fine work is built up by means of a roller covered with varnish. More varnish may be applied with a brush. An electrotype from the intaglio is thickened with type-metal mounted on a wooden block.

2507. Argamakoff, A., [*Bauler, B.,* partly]. Aug. 11.

Photo-mechanical printing.—Relates to the production of printing-surfaces for letterpress and lithographic work, for printing in several colours, and for obtaining prints resembling photographs. Strong ammonia is added to an aqueous solution of gelatine, and a thin layer is poured on to glass: the layer is dried at the ordinary temperature, and then washed in a bichromate solution containing alum. The dried prepared surface is then exposed to light under an original drawing or photographic positive or negative. A warm solution of gelatine is poured on to the prepared surface until it forms a thick layer; this layer can be taken off the prepared layer, when a design is obtained, either in relief or hollow according to which portion of the gelatine has swelled. A compound containing wax, gutta-percha, and oil is poured on the glass, and relief is given in the resulting gutta-percha plate by hollowing out the large white spaces by hand. The gutta-percha plate is then coated with blacklead, and an electrotype matrix is taken from it. The matrix is covered with turpentine, which is allowed to evaporate, and then with blacklead. The electrotype then obtained is adapted for use in a typographic press, the relief being in some cases increased by corrosion. The design can be transferred from the electrotype to a lithographic stone. For printing in several colours, an outline relief (one for each colour) is obtained from the coloured original by means of an outline drawing. From the outline relief an impression is taken on paper in blue; the portions corresponding to one of the colours are covered with Indian ink, and clichés are made separately for each simple colour. A copper plate prepared in this manner from a photographic negative may be treated with collodion and gelatinous ink to produce, by pressure on paper, a print resembling a photograph. Alum may be added to the ink.

3383. Lewthwaite, J. Nov. 7. *Drawings to Specification.*

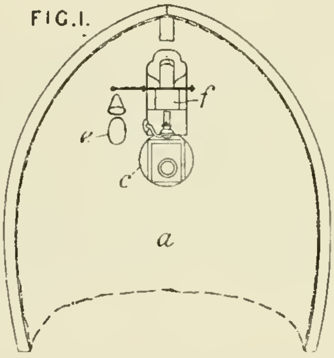
Tripod stands for apparatus for boring and working in rock, stone, or earth. The legs are connected together by a bolt at the top, and one leg is constructed like a ladder and carries a winch, the rope of which passes over a pulley at the top and supports the tool spindle and the hanging links which carry it. The legs are braced together by tie-rods, one tie-rod supporting a drum on which the supporting-links for the tool may be wound.

3695. Marsden, H. L. D. Dec. 4. [*Provisional protection only.*]

Rocking-apparatus; toning; fixing; washing.—Relates to machinery or apparatus for toning, fixing, and washing photographic prints, also applicable to rocking machinery or apparatus for other purposes. One or more vessels, containing the toning, fixing, or washing solutions, are arranged to be rocked mechanically by hand, foot, or other power. The vessels may be emptied by means of india-rubber or other tubes with or without joints, connected with an aperture or apertures in each receptacle.

3722. Lake, W. R., [*Proctor, G. K.*]. Dec. 7.

FIG.1.



Studio accessories; lighting-arrangements; copying drawings and the like; printing.—The sitter to be photographed is placed in a reflecting-chamber *a* lined with white cloth or other material. The front of the camera projects into the chamber through a hole *c*. After focussing by the aid of a gas or oil lamp *f*, the wire of a magnesium lamp is lighted through an opening *e* and the photograph is taken. The apparatus can also be used for copying pictures and for printing.

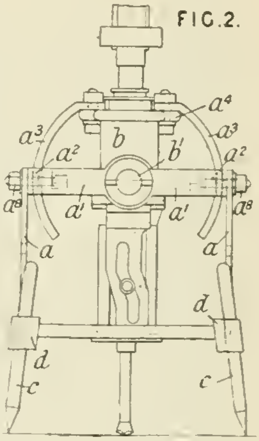
3849. Pouncy. J. Dec. 17.

Chromo-gelatine processes; colouring; sensitized films.—Relates to the production of plain or coloured photographic and other pictures. To produce a picture on the reverse or obverse side before transferring the same to the surface of the material where it is to remain permanently, a photograph is produced in carbon &c. mixed and prepared in oil, spirit, or water, and sensitized by methods described in Specification No. 780, A.D. 1858, or No. 267, A.D. 1863, or by other methods. The colours are laid on the reverse or obverse side of the picture before transferring the same. The method preferred is to apply the monochrome colour (carbon for instance) all over the surface of the material on which the picture is to be produced; when the negative is applied to the prepared or non-prepared surface, the light hardens the colouring-matter, leaving the other parts to be dissolved off by spirit or water. To produce a picture on a substance which can be rendered transparent and afterwards restored to its original opacity, the solution for giving transparency to the paper &c. consists of oils, wax, and glycerine, or like substance. To restore the opacity and develop the picture, boiled water is employed; the picture is finished by immersing it in turpentine, naphtha, or benzol.

3876. Lake, W. R., [*McKean, J. A.*]. Dec. 21.

Tripod and like stands.—Relates to supports for percussive drills for cutting and working rocks and other hard substances, and is an improvement on the invention described in Specification No. 1183, A.D. 1868. The wrought-iron or other metal side frames *a* are secured together by bolts, and are supported on pointed metal bars *c* which pass through sockets *d* and are held by screws. The cross-plate a^1 is formed with elbow pieces a^2, and through the ends of these pass bolts a^8 which also enter radial slots formed in the side frames *a*, allowing it to be secured at any inclination. The trunnion b^1 on the cylinder *b* fits in a boss in the plate a^1, and the radial arms a^3, attached to the cylinder cover a^4, slide in slots in the elbow pieces a^2, allowing them to take up different positions, in which they are held by bolts passing through them. In a modification, the cylinder is connected by the trunnion to a carriage which fits on a hollow column, and a pinion and rack enable the carriage to be raised or lowered, a ratchet-wheel and pawl locking it in position. The column can be set at any inclination by means of a hinged foot, and is secured by an adjusting-screw at the top, the nut of which rests on an india-rubber buffer.

FIG. 2.



A.D. 1869.

336. Johnson, J. R. Feb. 3. *Disclaimer.*

Chromo-gelatine processes; sensitized films; mounting prints and the like.—Relates to the production of photographic pictures in carbon or other pigments, which are obtained on a film or tissue of sensitized gelatine and retained, in a reversed position, upon the paper or support upon which they are produced; or transferred, by india-rubber paper, to another surface, so as to be in a non-reversed position. Instead of using a moist pigment preparation, a sheet of prepared pigment is employed; it is made by mixing the pigment, dye, or other colouring-matter with a small proportion of gelatine and sugar, and pouring the mixture on a slab to dry. For use, a part of this sheet is dissolved and mixed with a definite quantity of colourless gelatine, and the mixture is spread upon paper. Continuous lengths of tissue are made by supplying the support of porous paper from a roller and bringing it into contact with the surface of the pigmented gelatine solution. Instead of porous paper, the gelatine may be spread on a film of wax supported on a plate of metal, oiled cloth, &c.; and, after the picture has been printed on this from a negative, it may be transferred to its final support of paper &c. by melting the wax. Another improvement consists in the use of soluble resins &c., which become insoluble when dry, for cementing the pigment picture to its permanent support. Another improvement consists in mounting the gelatine image upon an impermeable surface, without cement. Pictures thus mounted may be used as models or patterns for engraved plates, or as a resist for plates to be etched. The gelatine image may be transferred from the impermeable glass or metal surface to the surface of paper, by means of an intervening film of wax. Another improvement consists in transferring a picture in one or many parts from its temporary to its permanent support. The picture is mounted on transparent waxed paper. The permanent support and the face of the picture are varnished, and the two varnished surfaces are pressed together and caused to adhere. The waxed paper is then warmed and removed.

385. Sarony, O. Feb. 8.

Mounting prints and the like.—Relates to means for producing enlarged and permanent pictures from small negatives. A small negative portrait is taken and enlarged to any suitable extent or variation upon glass, either by sun or artificial light. The enlarged portrait is backed with rough drawing-paper on which has been lithographed hatched shading or free hand lines or tinting, arranged so as to surround the transparent picture on the glass, thus imparting to the picture the effect of a sepia drawing. The hatching or toning, instead of being lithographed on paper, may be printed on the glass bearing the transparent picture, and in that case the portrait or picture may be backed with plain paper.

417. Fischer, W. H. Feb. 10. [*Provisional protection only.*]

Photo-mechanical printing.—Relates to a method of making a process block. A solution of gelatine, gum arabic, and sugar in water is filtered, and a saturated solution of potassium or ammonium bichromate is added. The mixture is poured on to a plate of glass, slate, or metal, and after drying the plate is placed under the negative and exposed. After treatment, the plate is printed from in the usual way.

806. Roper, E., and Shaw, G. March 16. *Drawings to Specification.*

Photo-mechanical printing.—For making a printing-surface, a block of compressed chalk, prepared for use as in the graphotype process of making printing-surfaces, described in Specifications No. 2309, A.D. 1860, and No. 664, A.D. 1864, is first coated with a waterproofing-solution and then with a thin film of gelatine containing potassium bichromate. The plate is then exposed under a negative &c., and treated with water in the usual way to develop the picture. By means of a solvent the waterproofing-material is removed from the parts unprotected by the hardened gelatine, and the relief is increased by brushing the chalk away from the unprotected parts. The block is then hardened, and a stereotype or electrotype obtained as in the graphotype process. In a modification, a sheet of thin paper is gelatinized, sensitized, exposed under a negative &c., and treated in the usual way. It is then varnished, dried, covered with a sheet of transfer paper, and passed through rollers. The papers are separated, and the design is transferred from the transfer paper to a chalk block, which is then brushed, hardened, and treated as described above. In another modification, the transfer paper is varnished, sensitized, exposed, &c., and the design transferred to a chalk block; or the chalk block may be sensitized and printed on directly. In some cases a photographic positive, instead of a negative, is employed for printing the design on the transfer paper or chalk block; the design then appears in white lines on the chalk block, and these exposed parts of the chalk surface are treated with a hardening-solution before the varnish covering the other parts is removed by a solvent. Instead of chalk blocks, chalk-coated rollers or cylinders may be produced by similar methods.

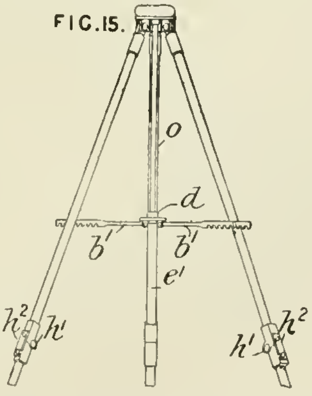
853. Robinson, J. V. March 20. [*Provisional protection only.*]

Negatives, producing by engraving or etching.—A glass plate is coated with silver, a metallic alloy, or a preparation of aniline. A drawing being made, with pen or pencil, upon this surface, the lines thereof are removed by means of a graver; or the drawing may be at once etched in without the aid of a pen or pencil sketch. The lines thus etched admit light through the plate, and the result is an etched negative. A print may be obtained from the negative on photographic paper, in the usual manner.

Photo-mechanical printing.—For producing a raised surface for printing, a plate of glass &c. is coated with a layer of gelatine to which has been added an alkaline bichromate. A negative, obtained as described above, being placed in contact with the prepared surface of gelatine and the combination exposed to light, the parts of the gelatine film acted on by the light are rendered insoluble in water. The gelatine plate is then placed in warm water, and the result is a relief picture corresponding to the lines of the etched negative. From this raised surface a stereotype or electrotype cast may be taken and printed from in the usual manner.

1312. Isaac, L. April 28.

FIG. 15.



Tripod stands.—Camera stands are constructed with a collar *d* sliding on a central rod *o* and carrying hinged tie-rods b^1 formed with racks which engage pins on the legs e^1. The legs are jointed at h^1, and the two parts are held in position by plates h^2 pivoted to the upper parts of the legs and formed with slots to engage pins fixed in the lower parts of the legs.

1798. Cook, W. June 10. *Drawings to Specification.*

Change-boxes ; dark slides.—A combined change-box and dark slide is divided by a horizontal partition into two equal compartments which are filled with plates. The edges and backs of the plates are covered with cardboard or other material. The front of the upper compartment of the change-box has an aperture at which the plate is exposed in the camera, and the closing of this aperture by a shutter pushes the exposed plate down into the lower compartment. An unexposed plate from the lower compartment is then lifted into the upper compartment by a slide fitted into the back of the change-box. The operation is repeated after each exposure.

1965. Courtenay, R. H. June 30.

Photo-mechanical printing. — Printing surfaces are produced from photographs by first taking a positive copy on a plate prepared with collodion or other solution to which a mineral, vegetable, or organic substance has been added, preferably either silica precipitated from potassium-silicate solution and dried, or powdered glass. A print is taken from the copy, on a glass plate coated with a composition of parchment size, sugar candy, gum, and chromic acid. This matrix is then washed, drained, immersed in gold-chloride solution, and drained again. It is then coated with a solution of silver nitrate and grape sugar, and immersed in a solution of ferrous sulphate and sugar. A deposit of silver is thus produced in and on the film, on which copper is deposited. The electrotype is then placed in hot water to remove the matrix, after which it is burnished ready for printing purposes. In another method of obtaining a conducting-surface for electro-deposition, silver powder, obtained by precipitation from a solution of silver in nitric acid by metallic copper, is dusted over the surface. A coating of silver-nitrate solution may be given to attach the silver particles, after which ferrous-sulphate solution may be used. A raised printing-surface is obtained from a " negative ingrain " by printing from the negative produced from a "positive ingrain," directly on a matrix similar to that described above. Portions of the finished plate may be removed to produce pure lights, or gelatine may be applied to the matrix before electrotyping. A transfer is taken from the intaglio plates on to metal or stone, and is etched in by a battery or other process. A positive is printed in ink from the negative ingrain on to paper prepared with the above-mentioned composition, and then transferred to stone or metal for photo-lithographic printing.

2022. Grüne, F. W. July 5. [*Provisional protection only.*]

Ornamenting by photography.—A photograph, obtained by the ordinary collodion process, to be transferred to the surface of wood, metal, ivory, &c. for ornamenting the surface or preparing it for engraving, is applied, face downwards, to the wood or other surface, and is fixed thereto by gum or other adhesive substance. Alcohol is applied to the back of the photograph to remove the water ; the collodion is then removed by means of ether, and the metallic picture remains on the surface.

2193. Trevor, D. July 20. [*Provisional protection only.*]

Dark slides ; change-boxes.—For taking several views of one sitter from different positions, or of several sitters, on the same sensitized plate, with one sensitizing, the sensitized plate is held in a circular disc of wood which works in a corresponding hole formed in an outer rim which may be square to enable it to be easily applied to the camera. In the disc is a square opening fitted with a door, for securing the sensitized plate. The front of the apparatus is obscured to the extent of the eccentric space requisite for taking the picture. If the disc is divided into six parts, one picture is taken, the cover is put over the lens, and the disc is revolved one-sixth of a revolution ; another picture is taken, and so on until the whole series of six is complete.

Mounting prints and the like.—The different pictures obtained from the plate described above may be mounted on a disc which may be revolved to bring the pictures upwards in succession ; or openings may be formed in the upper part of an additional disc, the compound picture being revolved underneath.

2718. Denne, T. J., and Billingsley, H. Sept. 18.

Photo-mechanical printing ; copying drawings and the like.—A mould or electrotype for producing printing-blocks is made by treating an ordinary negative on glass with a mixture of gum-resin, potassium bichromate, and water, drying, exposing to light, and washing out the parts not acted on with hot water, leaving a raised surface from which the mould is prepared. A picture, which can be transferred to a stone for printing from, is prepared by exposing behind a negative paper which has been treated with a mixture of potassium bichromate, gum arabic, and water, and allowed to dry, the picture thus produced being then covered with a groundwork of litho-tint and finally floated on warm water to remove the free gum &c. A negative copy of a picture is produced without the aid of a camera by treating thin paper with chloride of sodium, drying, floating on a bath of silver nitrate, again drying, and exposing behind the original. The negative is fixed by hyposulphite of soda, washed, and dried, and is used for printing positives or transfers as usual.

3049. Window, F. R. Oct. 19.

Colouring; sensitized plates and films; photo-mechanical printing.—Relates to the production of photographs in pigments on paper, wood, ivory, canvas, and other surfaces. The sensitive solution consists of albumen, some hygroscopic substance such as honey, gum, sugar, glucose, or several of these combined, and a soluble chromate. This solution is spread or poured upon the surface to be sensitized, dried, and exposed, under a negative, to light. Powdered pigment is brushed over the surface until the image is developed, and then fixed by alcohol or other agent and dried. The soluble portion of the coating is then dissolved out with acidulated water. The print is washed, and finally passed through water rendered slightly alkaline with ammonia. If the print is to have a glazed surface, collodion is the fixing-agent instead of alcohol. For pigment prints upon paper with a glazed surface the solution is employed without the albumen. A plate is coated with this solution, exposed under a negative, and developed with powdered pigment. Collodion is then poured over the coated surface, and left to dry; it is then transferred to gelatinized or albuminized paper. The developed print may be transferred to other surfaces having a glutinous coating, by means of pressure and moisture, or may be transferred to stone or zinc for direct printing. For this purpose the print is developed with a powder of a fatty or resinous nature. The developed print is laid upon the heated stone and pressed. On damping the back of the print the transfer is effected.

3151. Mewburn, J. C., [*Rye, E.*]. Oct. 30.

Photo-mechanical printing.—Relates to a photographic process for preparing printing-surfaces. A mixture composed of gelatine, albumen, and water is poured over a thick piece of plate glass, highly polished or plain. The glass bearing the film is dried in an oven, and is then exposed to light on the reverse side. The glass is then washed and dried, and another mixture containing gelatine, albumen, potassium bichromate, ammonium bichromate, gum myrrh, gum benzoin, silver nitrate, cadmium iodide, and potassium bromide is poured over it. After the glass has been exposed under a photographic negative, it is washed under strong pressure of water, so as to extract all the chromate, and, when dried, is ready for printing.

3543. Edwards, E. Dec. 8. *Disclaimer.*

Photo-mechanical printing.—A printing-surface is made by coating a metal, glass, or other plate with a layer of gelatine, gum, albumen, or fibrine &c. which has been hardened and rendered insoluble by means of ammonia, alum, or other substance. The layer is sensitized, either during its preparation or subsequently, by treating it with a chromate or bichromate. It is washed in water, coated with a second layer of insoluble sensitized gelatine, and the operation is repeated till, after exposure under a negative, all the details of the design appear. The plate is freed from bichromate by washing, and is then ready for printing. In printing, the plate is wetted and placed in an ordinary printing-press, in which the pressure is vertical. To obtain sufficient pressure in the shadows of the design without risk of breaking the plate, the pressure is transmitted to the plate by means of a mould consisting of a sheet of gutta-percha. In inking, to avoid tearing up the gelatine film by the adherence of the ink to the plate, rollers or dabbers of india-rubber are used, and the lithographic ink is thinned with tallow and oil. To procure prints of more than one tint from one plate, the inks are prepared of different degrees of stiffness and of the same or different colours, the stiffest ink being first applied; the next stiffest (which adheres only to the half tones) is then rolled in, and so on. To obtain prints with margins, a mask is employed.

Negatives, producing by other means than photography.—The Provisional Specification states that photographic prints or printing-surfaces may be obtained by coating sheets of transparent material with a substance impermeable to the actinic rays and removing or modifying, in places, the non-actinic layer, so as to form a design upon the sheet or plate. Prints from this plate are obtained by photography or by the above-described greasy-ink process.

3676. Wise, W. L., [*Kukatzkay's, Seyss, & Co.*]. Dec. 18.

Tripod stands.—An instrument for levelling and for measuring angles is supported by a stand the legs of which are pivoted to an outer hollow hemisphere, within which is mounted on knife edges an inner hollow hemisphere. To bring the instrument immediately into a level position, a pendulum k is fixed to the inner hemisphere.

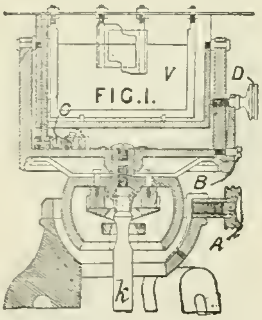


FIG. 1.

A.D. 1870.

89. Hemery, T. G. Jan. 12. [*Provisional protection only.*]

Producing photographs of special character; masking; composite photographs, producing.—Relates to the production of one negative from a combination of several negatives, in order to photograph two or more sitters, one in front of the other and overlapping. According to one method, the first figure, or that nearest to the camera, is photographed and developed in the usual way, as a negative, with a perfectly transparent background. The figure alone being covered with an opaque varnish, leaving the remainder of the plate transparent, the back of the plate is coated, sensitized and placed in the camera, and receives the image of the second sitter through the transparent portion of the front of the glass, thereby leaving a counterpart of the first figure on the back of the plate, perfect in outline but transparent after development. Lastly the opaque substance is removed from the front of the plate and a transparency is taken of the double negative from which a final negative, enlarged or reduced, may be obtained as usual. According to another method, one of two similar impressions of the first figure is rendered opaque, and is placed in the camera in front of a second plate so as to print a transparent figure thereon. The second plate and the unused impression of the first figure are combined together to afford a single negative. More negatives than two may be combined by this method. According to a third method, the two similar impressions of the first figure differ by their backgrounds, one being transparent, the other opaque. The first is superposed on the photograph of the second figure (having rendered the first figure opaque) and a transparency is taken of the combination. By combining two transparencies a perfect negative is obtained.

201. Johnson, J. R. Jan. 22.

Chromo-gelatine processes; sensitized films.—Relates to the preparation of paper or other surfaces for the production by photography of pictures in which the colouring-matter is lampblack or other pigment. The compound spread upon paper, for these purposes, usually contains gelatine, sugar, and bichromate of potash. The sugar in the above compound is replaced by soluble soaps or soft soap (oleate of potash). Instead of using a pigment ground in oil, mixed with bitumen or asphalt and soap &c., with or without a bichromate, and acting upon the compound with oil of turpentine to dissolve out the portions not acted upon by light, gelatine or its congeners is substituted for the bitumen or asphalt, thus enabling water to be used to develop the picture. The gelatine, in the above compounds, may be replaced wholly or in part by curd or caseine &c., which is insoluble in warm water but is rendered soluble by ammonia or other alkali. The caseine is precipitated, with rennet or by an acid, from skimmed milk. The resulting curd is collected on a filter, dried by pressure, and dissolved in dilute ammonia. This solution is used instead of a portion of the gelatine solution.

346. Woodbury, W. B. Feb. 7. [*Provisional protection only.*]

Photo-mechanical printing.—A gelatine relief of a design in black and white is produced from a photographic negative. From the relief a reverse is obtained in any soft metal, by hydraulic or other pressure. The reverse may be printed from, as an engraved plate, in fatty opaque inks. An electrotype may be made from the soft metal plate, if desired. A granular surface giving an ink-holding ground on the gelatine relief is obtained by substituting for the colour (in the carbon process) in the gelatine and bichromate, a coarse granular powder. In some cases, emery powder is dusted over the partially dry gelatine relief; the emery adhering only to the parts that represent the dark portions of the design. To produce by pressure, designs on cardboard, leather, &c. direct from the gelatine, a film of gelatine colour and bichromate is exposed under a photograph, and the exposed side is brought into contact with a sheet of copper or other metal under water, the two surfaces being pressed into close contact. The combination is then placed in hot water, which removes the greater portion of the gelatine, and dried. The plate when passed in a press will reproduce the design on the cardboard &c.

383. Foley, A., and Foley, H. Feb. 9.

Ornamenting by photography; sensitized plates.—To produce photographic pictures or designs on veneers and solid wood a piece of even-grained veneer is planed on both sides with a toothed iron plane. One side is left rough, the other is smoothed by scraping and rubbing with glass paper. The smooth side is damped, so as to cause the grain of the wood to rise. The wood is then allowed to dry, and the alternate damping and drying is repeated until the wood grain ceases to rise. The prepared surface is treated with sodium chloride, dried, and sensitized with nitrate of silver. Printing is then performed, on the sensitized wood, from a photographic negative.

802. Janicot, C. March 18.

Producing photographs of special character; colouring.—Tissues or fabrics are sensitized and photographic images produced by the usual processes. The photographic picture, on the fabric, is rendered transparent by paraffin or other suitable material. The reverse side of the fabric, thus made transparent, is painted, by following with a brush all the lines of the photographic image. The fabric is then rendered opaque by covering the dry painted side with opaque colour, or by pasting the painted fabric on paper or other opaque surface. A painted cloth, or surface, is thus obtained, on which the painting, applied on the reverse side to the photographic image, appears on the obverse side by the direct transparency of the fabric.

941. McCraw, W. March 31.

Colouring; ornamenting by photography; chromo-gelatine processes.—For obtaining a chromo-photograph, a positive is produced on glass from an ordinary negative. The glass is coated with collodion, so as to form a structureless or transparent film. The film, containing the picture in light and shade, is painted with appropriate local colours, and the painted surface is cemented to canvas, or other final support; the glass is then removed, leaving an untouched photograph supported by colours transferred to canvas. The picture may be varnished or worked upon by the artist's hand. Instead of the film being painted whilst upon the glass, it may be supported on paper for that purpose. This gives the picture in its true relative position, if a direct print on glass from a negative be employed. The process is applicable to photographs produced by the carbon process, enlargements by the camera, by the Woodbury process or by any other process, by which a photograph can be obtained on glass having a similar appearance on either side. The dusting-on process may be used, also vitreous or enamel colours may be employed. The process is available for the decoration of glass, enamel, or ceramic surfaces, and the colours may be burned in. The colours may be applied immediately to the canvas and the transparent photograph may be fixed thereon. When the picture is transferred to a rigid surface, the colours can then be applied by chromo-lithography or other means.

1333. Edwards, B. J. May 10.

Printing; composite photographs, producing.—For producing prints of combination photographs in which more than one negative is employed, the negatives are held firmly in a frame by means of a grooved sliding bar pressed against the end of the negative plate by a screw, and the sensitive paper is attached to another frame which by means of guiding pegs is made to fit accurately the frame carrying the negatives. Masks may be used to protect certain portions of the print from the action of light during the printing of other parts of the picture, these masks being cut by means of impressions from negatives. A print having been taken from the negative upon sensitive paper fixed or cemented to the frame, this frame is separated from the frame carrying the negative and the mask is adjusted on the print and fixed thereon by india-rubber solution. The frame carrying the print and mask is then brought into contact with the negative from which the next portion of the picture is to be made, and the whole is pressed together. The print is then lifted away and the mask may be removed by means of benzol. When the sensitive films on which the prints are to be taken are supported on glass or other plates these are held in a frame similar to that used for the negatives.

1466. Osterkamp, H. May 20. *Drawings to Specification.*

Tripod stands for rock drills. The rock drill is secured to an adjustable support on a two-legged frame to which is hinged another leg or rod, adjustable in length, to form a stand.

2171. Woodbury, W. B. Aug. 4.

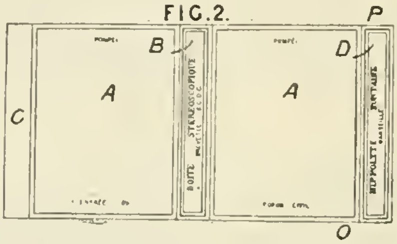
Photo-mechanical printing.—A part of the invention relates to the preparation of a printing-plate from a gelatine relief produced by ordinary means from a photographic negative of a design or drawing in which the shading is obtained by lines or dots, no half tints being used. The relief is dried, and a reverse is obtained from it in any soft metal, by hydraulic or other pressure. The metal plate is used as an engraved plate for printing from in fatty opaque inks. An electrotype may be made from the soft metal plate when several prints are required. Another part of the invention relates to a method of obtaining a granular surface to give an ink-holding ground, when the photographic negative possesses gradations of light and shade. A coarse granular substance is mixed with the bichromated gelatine; when acted upon by light transmitted through the negative this produces a relief having the required granular surface. In some cases, emery powder is dusted over the partially dried gelatine relief; the powder adheres only to the parts representing the dark portions of the design, thus giving to the soft metal plate produced by pressure from the gelatine a corresponding granular effect. According to another method two coatings of the granular gelatine mixture may be given, the first holding a fine and the second a coarse powder. Another part of the invention relates to a method of producing direct from the gelatine relief, by pressure in contact with cardboard, paper, leather, &c., designs on these materials. A film of gelatine, colour, and bichromate is exposed under a photograph; its exposed side is brought into contact with a sheet of metal under water, and the two surfaces are pressed into close contact. The plate with the gelatine adhering to it is then placed in hot water which removes the greater portion of the gelatine leaving the design in relief on the surface of the plate; it is then dried and passed through a press in contact with the cardboard, paper, &c. A design similar to a watermark may be produced on paper in this way.

2266. Window, F. R. Aug. 16.

Photo-mechanical printing.—Relates to methods of obtaining proofs or impressions from printing surfaces produced by photography, and also in obtaining such printing surfaces. The first part of the invention consists in obtaining impressions from any surface obtained by photographic agency. Two or more plates, instead of one, are produced from the same negative, each plate receiving a sufficient degree of exposure. The subject is thus divided into a series of flat tints. If the process be one yielding a surface giving a flat tint, each plate represents a tint and has a register mark obtained directly from the negative. These plates are printed in succession in a more or less transparent ink. If the process be one yielding surfaces with a certain degree of half tone, a smaller number of plates is necessary. An analogous process is applicable to the production of proofs in colour by using more surfaces and stopping out from each or from the negative the colours not required. The second part of the invention consists in a mode of obtaining printing surfaces on stone or zinc. By means of a negative, a positive image of the subject to be reproduced is obtained in a compound which forms a resist upon the stone and will absorb moisture from the atmosphere, such as a mixture of albumen and honey, or gum and honey, rendered sensitive by a chromate and spread upon paper. The parts not exposed to light adhere to the stone, and the whole is pressed. Or, a negative image is printed and the proof laid down upon the stone, after wetting it and scraping out the superfluous air and moisture. The non-actinized parts are washed away. The stone is washed in alum, dried, inked up, and the gelatine image sponged out. The remaining fatty image is treated for lithographic printing. Another way of forming a printing surface upon a stone &c. surface is by a gelatine film spread upon paper coated with gum arabic and sugar or glycerine. The gelatine is rendered insoluble by glacial acetic acid mixed with bichromate of potash. When dry the sensitive paper may be printed and then washed. The film is then mounted upon a well grained zinc or copper plate and dried; it is then ready to receive the ink.

2408. Fontaine, H. Sept. 13. [*Provisional protection not allowed.*]

FIG. 2.



Mounting prints &c.; producing photographs of special character.—Relates to the application of stereoscopic views or pictures to boxes or cases for holding matches &c. Fig. 2 shows the application of the invention to a match box. The surfaces A A of the box are occupied by the stereoscopic views and the parts B, C, D serve to form the sides of the case when the same is folded up. To obtain a printed or photographic view a negative stereotype is made having its surface equal to the development of the surface of the box; this stereotype is then engraved and used for printing the views on sheets which are afterwards folded to form the boxes; or the proofs may be obtained photographically. When it is desired to look at the view, the strip C is unfastened or the case is cut along the line O, P, and the box spread out and inserted in the stereoscope.

2464. Baldock, G., Denne, T. J., and **Hentschel, A.** Sept. 13.

Photo-mechanical printing; negatives for photo-mechanical printing, producing.—Relates to the manufacture of casting-blocks and printing-blocks used for heliographic and other printing. A preparation of casein or curd of milk is used in the formation of the blocks &c. Milk, which has become sour and set by keeping, is separated from grease and other extractive matters by skimming it, putting it into a bag, and submitting it to the action of water and pressure. When dried, the substance is suitable for use. To prepare a plain block for casting and printing, the foundation is made by dissolving the casein in water containing a little ammonia and adding China clay and glycerine. Paper or cardboard is coated with this composition. The coating is made insoluble by means of weak acetic acid and allowed to dry. This block can be sensitized in the ordinary way and a printing &c. block can be obtained by direct drawing upon it. This is done with an ink composed of potassium bichromate, Indian ink or lampblack, and gum. When the ink is dry the parts of the block not drawn upon are washed away with a solution of soap and soda. A negative may be copied upon a plain block. The block is sensitized with bichromate of potash, exposed under a negative and washed with soap and soda solution; the result is a relief picture from which a printing or casting block can be made. To prepare a paper negative for working on a plain block a drawing is made on paper in a compound containing casein and Indian ink or lampblack. The whole surface of the paper is covered with lithographic ink, and the paper is placed in water containing a little ammonia; the drawing, with its covering of ink, washes away, leaving the undrawn parts black. A printing block for half-tone printing to obtain a stereotype or electrotype directly from a negative may be prepared by this process. The block is composed of casein, soap, and potassium bichromate. The composition is printed through a negative, which is coated with it. The non-actinized portion is removed leaving a picture from which electrotypes can be taken. The method may also be applied to photo-lithographic transfers. Paper is coated with a mixture of casein, soap, and potassium bichromate. The dried paper is printed under a negative and the print is rolled in with lithographic ink. The picture being plunged into a weak ammonia solution, the non-actinized parts are dissolved away, leaving the picture, in ink, upon the paper; this is transferred to a lithographic stone. A similar process is used in photo-zincography, or "zinco-photography." In this case the zinc is coated directly with the composition and the paper is dispensed with. To prepare a "zinco-graphotype" block a zinc plate is coated with casein and soap to which is added Frankfort or other black ground in glycerine and water. The plate is drawn upon with a suitable point and the drawing brushed over with asphalt dissolved in turpentine. After drying, it is plunged into weak ammonia water which dissolves away the drawn parts. It is then washed and is ready for etching. A method of preparing for printing the surfaces of wood, metal, paper, &c. is also described which is especially applicable to the preparation of a printing block on wood. The wood is coated with a composition containing casein, zinc white or white lead, and chloride of ammonium. This coating is dried, covered with nitrate of silver, exposed under a negative and fixed with hyposulphite of soda; the block is then ready for the wood engraver. The composition may be modified by substituting for the zinc white or white lead, China clay, pipe clay, flake white, &c. A photograph printed in this way may be fixed by acetic acid and may be toned in the usual way.

2485. Edwards, E. Sept. 15.

Photo-mechanical printing.—Relates to improvements on the invention described in Specification No. 3543, A.D. 1869, and to other methods of photo-mechanical printing. 1st. To remove the printing films from the surfaces on which they have been prepared to those on which they are to be placed during printing in the press, the level surface to receive the gelatine film is cleaned and rubbed with a solution of wax in ether, or coated with collodion or india-rubber &c. The film is then prepared for printing by the usual methods. Adhesion of the printing film to the support for printing from is ensured by coating the support with Canada balsam, collodion, india-rubber, gelatine, albumen, or other cement or varnish. The film may be coated with india-rubber and pressed into contact with the support by heavy pressure; it may be made flexible by the addition of glycerine, sugar, or a non-drying oil. An intermediate film of gelatine mixed with a white pigment may be placed between the printing film and its supporting plate, especially when the support is made of ebonite, vulcanite, or other dark-coloured material. 2nd. When the printing surface is to be level, a plate of soft metal is used as the support, and heavy pressure applied, which embeds the gelatine film into the metallic surface; or the printing film after attachment to a glass or other support is swollen by allowing it to absorb water and is then backed up with plaster of Paris or cement as in the preparation of electrotype plates. 3rd. In printing proofs, great intensity of the shadows is obtained by dusting over them, after printing, powder colours such as are used in lithography. When great intensity is required, the copper-plate method of inking with a dabber is employed, and the surplus ink is cleared off the plate with a roller. When prints are required with margins, metal masks are used, instead of the paper ones described in Specification No. 3543, A.D. 1869. The printing films may also be transferred to cylinders for use in a cylinder printing machine. 4th. To produce reversed or non-reversed pictures from ordinary negatives, a very deep actinic impression is obtained on the printing film, which is inked on the reverse side to that which has been in contact with the negative. Or, a gelatine print is transferred for development to the surface of a film of insoluble gelatine, the surplus gelatine being washed away with hot water; the plate is dried, damped, and printed. Printing films may be prepared from ordinary negatives; or, the back of the negative may be placed in contact with the printing film and the printing may take place through the glass. Plates may be prepared for printing by rendering a gelatine film insoluble by the addition of a solution of perchloride of iron and tartaric acid; those parts that have been actinized become again absorbent. Transparent positives are necessary for printing by this method. 5th. When lithographic or other stone is used, it is thoroughly dried and immersed in a solution containing gum or gelatine, bichromate of potash, and alum; the stone is dried, actinized, washed, and printed from. A printing block may be made by the admixture of plaster of Paris, Portland cement, or artificial stone, with sensitized gelatine and a bichromate. 6th. Prints in transfer ink on transfer paper may be obtained from the printing films and then transferred to wood blocks for woodcut printing, or to stone or zinc for lithography or zincography, or to stone, copper, steel, or zinc for engraving; they may also be transferred to wood or metal for ornamental purposes &c., or engraving. Or, the plates on which the transfers are to be made may be placed directly in contact with the printing film.

2948. Wallace, W. V. Nov. 9. [*Provisional protection only.*]

Sensitized plates.—In order to provide a substitute for ivory, paper, or other materials used for photographic printing, when great delicacy and evenness of surface is required, a metal or other impervious surface is treated with various kinds of wax or its compounds. White or coloured wax (preferably pure sun-bleached wax) is used, mixed by means of heat with a white body colour, such as flake white, white lead, zinc white, or similar substances, either pure or tinted. This mixture is applied to the surface by heat &c.

3036. Sawyer, J. R. Nov. 19. [*Provisional protection only.*]

Photo-mechanical printing. — Printing-surfaces which may be used in photo-mechanical printing, and on which any writing, lettering, drawing, addition, or alteration may be made, are prepared by placing on a metal, stone, enamel, glass, porcelain, wood, &c. surface a layer of gelatine dissolved in water, to which are added ammonium or potassium bichromates, either separately or mixed. The layer is dried by hot air, being kept perfectly level during the process, and is then exposed, under a negative, to the action of light. The plate is subsequently removed, placed for about an hour in a dish of cold water which is changed three or four times, removed, well washed under a tap, and allowed to dry and harden at about 100° F. At the end of two days or more the plate is placed on the carriage of an ordinary lithographic press, the bed of which is fitted with a piece of soft wood of the size and thickness of the largest lithographic stone the press will take, the plate being kept in place by wooden studs which drop into holes made in the wood. The plate is now damped with a soft sponge to cause the gelatine to absorb as much water as possible. The surface is then dried with a very fine soft cloth and transfer ink is rolled in with an ordinary ink roller. When the plate is properly inked, a piece of transfer paper, which may be coated, is placed upon it; upon this five or six sheets of fine soft paper are placed, and the tympan is folded down and, after adjusting the pressure, is carried beneath the scraper of the press. The paper is carefully raised from the gelatine surface. The picture is cut to the size and shape desired and is damped between damp blotting paper. A polished lithographic stone heated to about 100° F. is placed upon the accurately adjusted and levelled bed of an ordinary lithographic press. The damp print is placed in the required position on the stone, on which any writing, lettering, or design may have been previously made either by writing &c. on the stone or by the ordinary mode of transfer. The print is covered with soft paper, the pressure is adjusted, and the stone is passed several times through the press. The back of the print, which now adheres to the stone, is now sponged with water, the stone is turned and passed through the press in the opposite direction, and the back of the print is softened with water and gently rubbed with the fingers until the paper can be easily removed from the stone. The impression is then gummed and inked up like an ordinary lithographic transfer, and if the design or writing has not been previously added to the stone, it may now be added. The image on the stone may be strengthened, weakened, or modified by touching up or erasing, and the whole may be printed from, either by hand or mechanical power, in the ordinary lithographic or copper-plate printing press, and using ordinary lithographic inks. In another method, paper is used, prepared with gelatine and lampblack; this paper or tissue is floated in a solution of potassium bichromate, dried, and exposed under a negative. The tissue is next immersed in water, and when softened and rendered limp, is laid face downwards on a polished lithographic stone or a piece of plate glass which has been coated with a mixture of albumen, gelatine, and potassium bichromate, the tissue being made to adhere firmly by means of a squeegee. The stone or glass is now immersed, face downwards, in water at a temperature of about 120° F. This removes the paper and the surplus gelatine and carbon, leaving the picture on the stone or glass. Writing &c. is now added, and the stone &c. is inked and placed in the press. The tissue, before being transferred to the stone &c., is coated, on its face, with a solution of india-rubber in benzole and placed face downwards on a piece of paper also coated with india-rubber solution. On placing it in warm water the paper, which originally carried the gelatine and carbon, floats off and the picture develops by the removal of the surplus gelatine and carbon. When complete, the picture is cut to the desired shape and size and pressed upon a polished lithographic stone or on plate glass coated as before. When dry, the adhering paper is removed by means of benzole. When it is necessary to print only a few copies, they may be printed from the original gelatine film. This film may be rendered hard and tough by means of a solution of hard gum or lac, preferably white lac, in spirit.

3131. Taylor, F. B. Nov. 29.

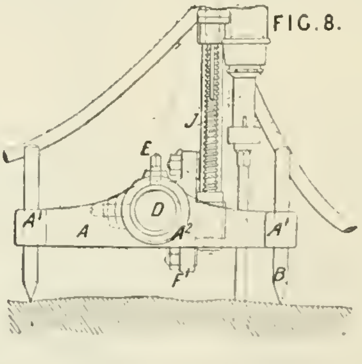


FIG. 8.

Stands for rock drills are made with two metal side plates A having sockets A^1 at each end fitted with steel bars B, which are held, after adjustment, by pinching screws. A tubular shaft D is held, by pinching screws E, in sockets A^2 in the plates A, and upon it is adjustably fitted a clamp having on one side a recessed disc F^1 in which is held an adjustable plate formed with sockets for receiving the supporting column &c. of the drilling-machine.

A.D. 1871.

401. Brown, J. Feb. 16.

Photo-mechanical printing. — Printed surfaces, prepared by photo-lithography or photo-zincography or other photographic process, are employed for ornamenting paper or paper cloth which is to be cut up for making collars, cuffs, and shirt fronts. A photographic picture is taken of a piece of lace, for instance, and a print from the picture is taken on a surface of gelatine prepared with potassium bichromate. The gelatine surface is coated with lithographic ink, moistened with water, and is sponged over. Those portions of the surface which have not been rendered insoluble are thus removed, together with their coating of lithographic ink, leaving an image, in lithographic ink, of the lace ; this image is subsequently transferred by pressure to the surface of a lithographic stone or plate, and the paper &c. from which the articles are to be manufactured is printed therefrom.

447. Holmes, S. Feb. 21. [*Provisional protection only.*]

Cameras ; lenses.—Relates to optical instruments of the binocular form and consists in the application of a prism or prisms, or a divided lens or lenses, to the object piece of the instrument, which arrangement, by refraction, deflects the light from the right side of the object piece into the left eyepiece and *vice versâ.* The arrangement may be applied to cameras &c.

468. Macdermott, M., and **Williams, A. D.** Feb. 22.

Tripod stands or frames for rock drills. One leg of the frame is fitted with a metal cup Q, Fig. 23, having an india-rubber diaphragm R bolted to it, so as to be airtight, rubber packing being inserted between the diaphragm and the lip of the cup. By means of a screw S and nut T, the diaphragm may be drawn from the surface of the rock, thus creating a vacuum and securing the frame in position. In some cases, a circular "Lewis" is employed, as shown in Fig. 25, which is inserted in a hole drilled in the rock. The screw is then turned, its conical head causing the "Lewis" to expand in the hole.

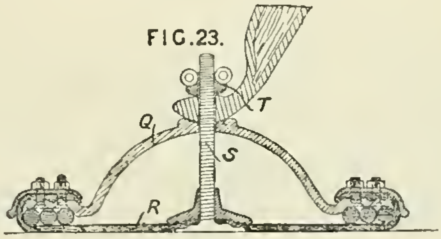


FIG. 23.

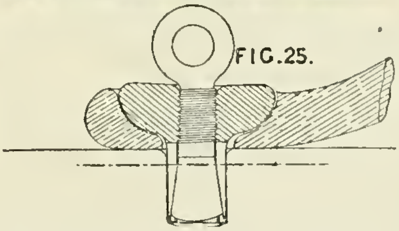


FIG. 25.

540. Haseltine, G., [*Leggo, W. A.*]. Feb. 28.

Photo-mechanical printing ; masks and masking. —Relates to a photo-electrotyping process as described in Specification No. 1541, A.D. 1865, and to the manufacture of stopping-out plates for use in this process and for use in photographic processes generally. The photograph after being varnished and dried as described in the prior Specification is rubbed carefully with a piece of cotton wool, so as to give it a fine polish or gloss. A cold gelatine coating is applied and the exposure to light is made, after which the gelatine coating is washed in hot water and then in cold water. The coating is now soaked in hyposulphite of soda solution &c., washed, soaked in protosulphate of iron solution &c., and again washed. A plaster cast is now taken and the depth required is obtained by further applications of a sensitive compound with exposures to light. This is accomplished by soaking the plate for a short time in dilute nitric acid &c., washing, and drying, and then applying the sensitized compound made up of potassium bichromate, gelatine, and water. In this case the compound is applied in a warm state. A third application of the compound may be made in the same manner should the requisite depth not have been obtained. A stopping-out plate is of great advantage in exposing these further sensitized coatings. In making these plates, a collodion negative, taken from the positive photograph to be electrotyped, is exposed with a second sensitive collodion film, and the latter, which is a soft blurred-looking copy of the original, is placed over the jellied positive during exposure to prevent the light from acting too strongly upon the design itself or upon certain portions of it. Other stopping-out plates made by painting &c. upon glass or by other methods may be used.

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622. Edwards, B. J. March 8.

FIG.3.

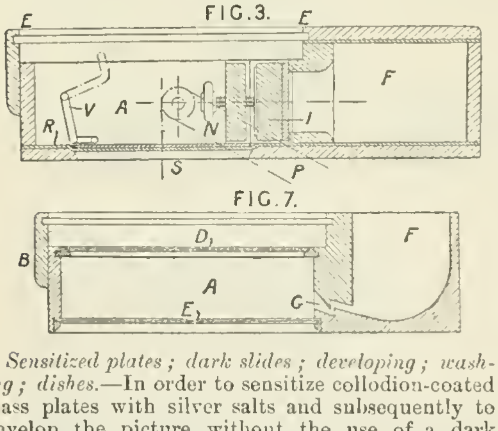
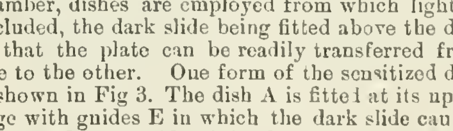


FIG.7.



Sensitized plates ; dark slides ; developing ; washing ; dishes.—In order to sensitize collodion-coated glass plates with silver salts and subsequently to develop the picture without the use of a dark chamber, dishes are employed from which light is excluded, the dark slide being fitted above the dish so that the plate can be readily transferred from one to the other. One form of the sensitized dish is shown in Fig 3. The dish A is fitted at its upper edge with guides E in which the dark slide can be fitted, and at one side of the dish is a closed trough or reservoir F containing the silver solution which is retained therein by a rubber-faced door I fastened by screws N. The plate is placed in the dish A with the collodion side uppermost, and the door I is then opened to allow the solution to flow into the dish A. When the plate is sufficiently sensitized the dish A is tilted by means of hinged legs P or otherwise so that the solution returns to the reservoir F. A sliding shutter at the back of the dark slide similar to that in front of the slide is then opened to admit the plate which is raised from the dish A by a crank V or by the hand of the operator pressing upwards on an india-rubber diaphragm R through a hole S in the bottom of the dish. A pneumatic plate holder may be attached to the diaphragm R by means of which the plate may be temporarily attached to the diaphragm so that it can be readily lifted. In another form, the trough or reservoir F is open and the door I is dispensed with, communication between the reservoir and dish being made by a small zig-zag passage which excludes light from the dish. The dish employed for developing the picture is shown in Fig. 7. The developing solution is contained in a reservoir F which communicates with the dish A by the zig-zag passage G which excludes light from the dish. The dish is fitted at the top and bottom with transparent coloured slides D and E. The dark slide with the plate is fitted in the guides B above the dish ; the sliding-shutter at the back of the dark slide and the coloured slide D are withdrawn, allowing the plate to fall into the solution. The development is watched through the coloured slides, and when it is completed the dish is tilted to run off the solution ; the dish is then used for washing the plate, which is finally removed through the slide E.

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730. Denne, T. J., and **Hentschel, A.** March 18.

Finishing.—The surfaces of photographs &c. are treated so as to render them permanent and protect them from damp. Casein is dissolved in a solution of boiled soap and water, or in a weak ammonia solution. The paper is coated with this solution and is then dried. In order to polish the coated surface, the paper is soaked in weak acid solution, preferably acetic acid and water to which a little oxgall is added, or in a solution of alum and gall. The coated surface of the paper is laid face downwards on a sheet of glass, which has been previously wiped over with gall to prevent the paper sticking to the glass. Air and superfluous moisture are expelled by pressure from beneath the coated surface, which is then left upon the glass until it is dry. When removed the paper has a glazed and polished appearance. Ox-gall may be added to the casein solution, and in order to give greater flexibility to the casein surface glycerine may be added to the solution. A colouring ingredient may be added to the casein solution if desired. The Provisional Specification states that casein manufactured as described in Specification No. 2464, A.D. 1870, [*Abridgment Class* Acids and salts, Organic, &c.], may be used.

1038. Lake, W. R., [*Goodes, E. A.*]. April 20.

Colouring ; positives, producing directly ; ornamenting by photography ; transparencies ; producing magic-lantern slides ; copying documents ; photo-micrography.—Relates to a process for rendering photographs on glass permanent, weather-proof, and coloured, the process being applicable for producing stained glass for the windows of churches and other buildings, stained scale marks on gauges for steam engines &c., clock fronts and faces, monograms or names on manufactured glass articles, and for ornamenting glass for lamp and gas shades, coach and carriage lanterns, signs for hotels and shops, &c., also for the preservation of photographic copies of documents, plans, &c., and the production of slides for magic-lanterns, stereopticons, stereoscopes, &c., and waterproof microscopic pictures of natural objects. The photograph is taken on a collodion-coated plate excited by immersion in a silver bath, developed, fixed, washed and dried as usual, and is then heated in an airtight kiln or otherwise until it attains a brown colour ; it is then cooled and a brown powder formed on the surface is washed off, leaving the permanent photograph in tints varying from a pale yellow to a deep red or brown. By employing less heat a clear white positive or negative picture may be obtained. If the heat is continued until the silver is reduced to the metallic state a picture with metallic lustre is obtained.

1409. Gilbee, W. A., [*Leggo, W. A.*, and *Desbarats, G. E.*]. May 25. [*Provisional protection only.*]

Photo-mechanical printing ; negatives for photo-mechanical printing, producing.—Relates to the production of negative or positive photographs, in which the graduations of light and shade are shown in granulations, to be employed in the manufacture of leggotypes and of transfers for stone or zinc. To make a granulated positive, a copy is made of a negative photograph in contact with a granulated plate (of known construction), the two together forming one object. From the positive so made a surface type is produced by leggotyping, capable of being printed from in a printing press. A granulated negative is made by copying the positive described above, or by copying an ordinary positive in combination with a granulated plate. From this negative intaglio plates are produced by the leggotyping process capable of being printed from in the ordinary copper-plate printing press. Negatives so made are also employed in the production of impressions on paper in transfer ink for transference to stone, zinc, &c.

1968. Grubb, H. July 27. [*Provisional protection only.*]

Lenses.—In order to correct the curvilinear distortion of the image which occurs with ordinary landscape lenses or "patent aplanatic view lenses" and thus to render such lenses suitable for the production of architectural views, a plano-convex lens is fitted a short distance in front of the primary lens with its convex surface to the front, and a plano-concave lens is fitted behind the primary lens with its concave surface to the front. The combined power of these two supplementary lenses is about zero, so that the focus of the primary lens is not affected while the distortion is corrected. By altering the distances between the lenses the photographer may produce a slight amount of either kind of distortion.

2166. Haseltine, G., [*Hedden, H. M.*, and *Hill, C. A.*, (trading as *Phœnix Plate Co.*)]. Aug. 17.

Positives, producing directly.—Ferrotype plates for portraits and other sun pictures are prepared by coating metal plates with a coloured composition instead of the usual black varnish or japan. The composition consists of "Indian red" or other oxide of iron boiled with linseed oil and mixed with spirits of turpentine or naphtha.

2184. Holmes, S. Aug. 19. [*Provisional protection not allowed.*]

Cameras ; lens fittings.—The object piece of a binocular microscope or camera &c. is fitted with a prism or prisms or a divided lens or lenses so that, by refraction, the light from the right side of the object piece is deflected into the left eye piece, and *vice versâ.*

2799. Edwards, E. Oct. 20.

Photo-mechanical printing ; negatives for photo-mechanical printing, producing.—Relates to improvements in the methods described in Specifications No. 3543, A.D. 1869, and No. 2485, A.D. 1870 ; also to materials and appliances for carrying out these and other methods, and to methods of photo-mechanical printing in two or more colours. The first part of the invention consists in making rollers for spreading the ink upon the prepared gelatinous surface, or "forme" from which impressions are to be taken, of a composition in which oil or grease, or oil combined with an alkali, is added to the composition of treacle and gelatine ordinarily used for making printing-rollers. A substance tending to produce insolubility of gelatine, such as chrome alum, and dissolved india-rubber, may be used in the composition. The second part of the invention consists in adding dyes or colours to the water used in damping those parts of the prepared gelatinous surfaces which are not to take the ink ; this operation results in a uniform wash or tint being applied to those parts of the printed pictures which are free from ink. The third part of the invention relates to methods of obtaining printed pictures in two or more colours. One method consists in making the same number of negatives as there are to be colours. In each negative, all is stopped out except the part to be printed in the given colour. A prepared gelatinous surface is then made from each negative, and each surface is inked of a given colour. Each surface printed in succession on the same paper produces the picture. Instead of several negatives, one negative with a series of masks may be used. Another method consists in printing from a gelatinous surface prepared from a photographic negative, a number of coloured prints of such tints that the actinic effect of each print is the same as that of the paper on which it is printed; for instance light blue upon white paper. The number of prints corresponds to the number of colours in the finished picture, and that portion of each print which is to be of a given is worked up in black and white by hand. A negative is obtained from each print, only the parts worked up in black and white being produced since the remainder is actinically identical with the paper. From these negatives separate prepared gelatinous surfaces are obtained, and each surface is used in succession, but with a different coloured ink, to obtain the picture. A third mode consists in masking out in the gelatine forme all parts of the picture except those to be printed in the particular coloured ink then being used.

2909. Wenderoth, F. A. Oct. 30. [*Provisional protection only.*]

Sensitized plates; mounting prints and the like; chromo-gelatine processes.—A photographic picture is produced upon a metallic plate. A metallic surface, preferably a plate of Britannia metal coated with silver, is prepared by rubbing it with fine sand, so as to cover the surface with a multitude of fine scratches that give brilliancy to the picture in consequence of the light reflected from the surface. Upon the plate thus prepared the picture is printed from a glass negative in any of the known modes, such, for instance, as the collodion dry or wet process, or the collodion chloride process. Chromatized gelatine with a colouring pigment may be employed, so as to vary the colour of the developed picture. In any case the positive picture printed upon the sensitized surface is intensified in its lights by the light reflected from the surface of the metal plate. When the picture is finished, it is rendered more durable by sealing it to a piece of plate glass the same size as the metal plate, and for this purpose white beeswax or similar material may be employed.

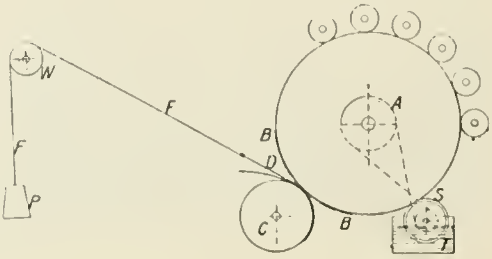
3069. Stillman, W. J. Nov. 14. [*Provisional protection only.*]

Cameras.—The base-board of a camera is made in three portions, so jointed and hinged together that they enclose the parts of the camera when closed up, and, when open, they form a base for extending the gussets of the camera, in order to obtain the proper focus on the sensitive plate. Two gussets are in connection with a central partition in the camera; the forward gusset is connected with the frame and slide of the lens, and the hinder gusset with the back which carries the dark slide. The sliding-board, carrying the lens frame, moves in grooves in the base-board and is so jointed to the base-board, that the whole can be closed together. The slide or sliding board is adjusted by a screw and nut for focussing. The back is also moved in grooves in the base-board, and is clamped in a suitable position by screws. The back of the camera is so constructed that the under side of it forms a longitudinal section of a cylinder and is fitted to a shoe, so that the back and shoe may be clamped by a screw, lever, or wedge. The dark slide may be fixed at any angle of inclination to the base-board by this form of swing back.

A.D. 1872.

73. Edwards, E. Jan. 9.

Photo-mechanical printing; negatives for photo-mechanical printing, producing.—Relates to the processes of photo-mechanical printing described in Specifications No. 3543, A.D. 1869, No. 2485, A.D. 1870, and No. 2799, A.D. 1871. The printing of pictures upon paper is rendered easier and more certain by means of a prepared gelatine surface from which the impressions are taken. To facilitate the printing of pictures upon enamelled paper, hard gum or resin is added to the enamel composition used in preparing the surface of the paper.



Shellac dissolved in water with ammonia or borax may be used. Substances of an oily or waxy nature, such as linseed oil, or a substance tending to render gelatine insoluble, such as chrome alum, may be added to the enamel composition. These substances may be applied to the surface of the paper or added to the paper pulp during the process of manufacture. In using steam printing machines, two or more sets of inking-rollers are used, so as to ink the formes with two or more inks of different shades and colours, the rollers being placed together or at each end of the machine. The rollers may be stationary, the forme passing under them, or they may pass over the forme; when advisable each roller has different inking qualities imparted to it by varying the quantity of oil &c. used in its manufacture. The pressure is preferably applied by a platen descending upon the forme or by a cylinder under which the forme passes. If the forme requires damping, a cylinder of wet cloth, flannel, india-rubber, sponge, &c. is used, a scraper, having an india-rubber tongue, being placed behind it to remove the surplus water from the forme. The paper is placed on the machine by hand or any ordinary method, and is removed in a similar manner, or by rods which cause the tympan to rise as the forme is moved from under the platen. The gelatine forme may be attached to a portion of a cylinder, the remainder of which forms the inking table. The cylinder rotates and passes under a number of stationary rollers. The forme B is attached to a thin metal plate which is bent to the curve of the cylinder A and attached to it by screws, binders, or other fastenings. The damping is effected by a roller S of flannel &c. dipping into a trough T of water. When necessary the forme is subsequently passed under a squeegee and a roller of blotting paper or other absorbent material. The two series of rollers, used in double or compound inking, are controlled by cams, eccentrics, and rods so as to touch and work only upon those parts of the cylinder inked with the corresponding inks. The masking of the picture, or the application of a flexible sheet having an opening of the size of the finished picture or of the part of it which is to be printed, is effected by one end of the mask D being attached to the pressure cylinder C, the other end being attached to a rope F passing over a pulley W and having a weight P or a spring attached to it. On the return of the pressure cylinder the picture is left on it and the mask is released from the forme. Sometimes the mask is fed in together with the paper on which the impression is to be printed and is returned to its position by means of the weight, the impression being carried away by grippers or rods. The damping, inking, and pressure apparatus are arranged so as to be detached altogether or separately. A deliquescent substance, such as calcium chloride, is sometimes added to the damping-liquid. Glycerine, treacle, or other non-drying substance which will mix with water may be used. This method is also applied to lithographic and other methods of printing where damping is required. An aqueous solution of a hard gum or resin, such as colophony or lac, with borax, ammonia, &c., is used to prepare a forme from which pictures may be printed. This material, when dry, forms a hard waterproof substance. Substances such as gum, albumen, and gelatine, together with a substance such as chrome alum, are added to the solution to give the forme the required porosity. The composition is made sensitive to the action of light by the addition of a chromate or bichromate. When it is desired to add designs, words, or letters to the pictures, a solution of alum or other substance tending to produce insolubility of gelatine, is applied to the forme. The parts so treated will take the greasy ink when applied, but refuse the water used for damping the film. The solution of alum &c. may be first applied to the surface of paper &c., from which it is transferred to the forme by pressure. Where it is desired that designs &c. so added shall be less distinct than the picture, they are printed upon the back of the forme by means of a separate transparent negative, the printing being continued until the light has produced a sufficient effect upon the face of the forme.

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149. Clark, A. M., [*Weyde, H. V.*]. Jan. 17.

Colouring.—Relates to a method of combining and applying dry colours and crayons with other substances, for the production of mezzotint effects or atmospheric stipples, stippled effects or appearances, in any tint or colour, on albuminized, glutenized, and gelatinized paper surfaces suitable for photographic prints. The dry colour or crayon is mixed with pulverized pumicestone and rubbed into the surface of the print or paper at the parts required to be tinted with the aid of a soft pad. Other materials may be substituted for pumicestone such as "flour of glass," "pulverized cuttle-"fish," or emery powder when a brown colour is required. A little Naples yellow rubbed all over will increase the luminous effect.

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616. Bablon, V. Feb. 28.

Photometers.—Relates to an arrangement of manometers and cocks for determining the flow of gas in gas burners and for use in photometry &c. Separate manometers N and M are connected with the burner and with a chamber A between the burner tap C and one or more regulating-taps *a*, *b*, *c*, formed with varying orifices. The apparatus is supplied with gas by a pipe P under a constant pressure derived "from a gas meter or pressure "gauge." To graduate the instrument the taps *a*, *b*, *c* are opened in succession, and the rates of flow in litres per hour corresponding to different positions of the tap C are marked on the three successive scales a^1, b^1, c^1 corresponding with the three taps *a*, *b*, *c*. Instead of three taps, one tap of the ordinary construction may be used and the graduation effected in three or more fixed positions of the same. The manometer N shows the actual burner pressure at any time. The apparatus thus shows (1) the delivery at a fixed pressure, (2) the burner pressure at a fixed delivery; and in conjunction with a photometric test, (3) the lighting power at fixed expenditure, (4) the delivery for fixed lighting power.

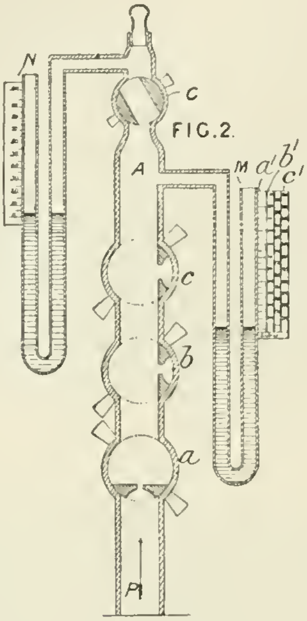


FIG. 2.

641. Smith, G. R., [*Weyde, H. V.*, and *Sarony, O.*]. March 1. [*Provisional protection only.*]

Colouring; finishing.—Dry colours and pulverized pumicestone &c. are rubbed together or separately with a soft pad over the backgrounds and other parts of photographs and albuminized, glossy, or other surfaces to produce a stippled tinted effect.

826. Garey, W. March 19.

Printing-paper. — To obtain improved effects when photographic printing is combined with ordinary printing, for instance, when a portrait is encircled by an ornamental lithographed border, the border or other device is printed on the paper which is to be subjected to the photographic process, previously to the albuminization of the paper. The paper is then albuminized so that the albuminous coating covers the printed part as well as the plain portion upon which the photograph is to be afterwards printed. The completed picture will thus have a uniform glaze or finish.

840. Window, F. R. March 20. [*Provisional protection only.*]

Producing silhouettes.—A light coloured background is lighted strongly and the subject to be silhouetted is placed in front of it in such a position that little or no light can fall upon the subject from the front. A photograph is then taken of the lighted background and the unlighted subject intervening. This is printed from on photographic paper, or by photo-lithography on any suitable material.

1395. Slater, A. May 7. [*Provisional protection only.*]

Photo-mechanical printing.—Relates to methods of reproducing copies of photographs in the printing press from an ordinary lithographic stone. A picture in gelatine leaf is obtained from a photographic negative, and over it is passed two inking rollers with lithographic printing inks of different densities, and then an impression is taken from the leaf on lithographic transfer paper. This impression is transferred from the transfer paper to a lithographic stone. Or the picture obtained in leaf may be embedded in type metal by pressure, thus leaving a print. This print is inked and an impression taken on lithographic transfer paper which is transferred to a lithographic stone. Another method is to obtain an undeveloped picture on a film of gelatine mixed with alum. The picture is absorbent of greasy ink, and the ground is non-absorbent of greasy ink but absorbent of water. This film is inked with two rollers having inks of different densities, and an impression taken on lithographic transfer paper which is transferred to a lithographic stone from which prints can be taken.

1642. Faulkner, R. May 30.

Colouring.—In order to roughen or granulate those parts of photographic pictures which are to be coloured, to enable them to take the colour more readily, a powder such as fine emery or glass, ground silex or pumicestone, metal filings, &c., or a roughened surface, such as a sheet of emery, glass, or pumice paper, or of linen, is pressed on to either the back or the front of the picture, the parts not required to be coloured being protected. The powder, when used, may be made into a paste which may be adhesive if the powder is to remain on the surface to produce special effects. The roughening of the picture may also be effected by pressure from engraved plates or rollers.

1700. Faulkner, R. June 5. [*Provisional protection only.*]

Printing; producing photographs of special character.—To produce a lined, dotted, stippled, or similar background in printed photographs, a pattern for the ground may be drawn on a paper or other surface and photographed. From this negative the film, after a protective transparent coating of gum, gelatine, india-rubber, &c. is applied to it, is removed. This film is interposed between the negative of the picture and the surface on which it is to be printed by light. To present the appearance of a line engraving, the groundwork negative is produced from wire gauze. A dotted effect may be produced from a pigment held in mechanical suspension in liquid. Other effects may be produced on the groundwork by photographing various objects such as the wings or heads of insects &c., or by photographing parts of the groundwork out of focus. These negative films may also be used for superposing objects with more or less faintness over the objects of the principal picture. The superposed objects may be used in combination with the groundwork.

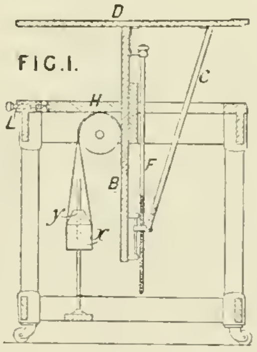
1789. Browning, J. June 13. [*Provisional protection only.*]

Photometers.—One or more mirrors or reflectors are fitted in a tube and so arranged in connection with apertures that the light from two flames is received into an eye-piece at the opposite end of the tube. Outside the apertures are arranged one or more revolving sockets ; one containing a tinted wedge of glass, which may be slid in or out until the illumination from the two lights is equal. This wedge piece is graduated, to indicate the relative brilliancy of the lights. The other socket is fixed and carries a glass of the same tint. Ground glass &c. may be used at the apertures to soften the light. The reflectors in the tube may be mirrors or total-reflection prisms, or they may consist of one prism reflecting from two faces.

1970. Spahn, E. P. June 29.

Camera stands.—The camera is supported on a table D hinged on the top of a vertically-sliding bar B which can be held in any position by a clamping plate H operated by a screw L. The weight of the table and camera is balanced by weights *x*, *y* or by springs. The table can be set at any inclination by means of a stay c adjusted by a screw F.

FIG.I.



2008. Le Gros, E., [*Silva, W. d'*]. July 3. *Disclaimer.*

Tripod stands.—Rock and other drills are supported on adjustable tripod legs B, so that the drills can be worked in various positions.

(*For Figure see next column.*)

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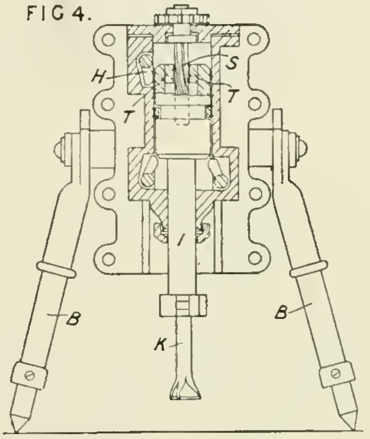
FIG 4.



2684. Lake, W. R., [*Weston, E. R.*, and *McDonald, T.*]. Sept. 12.

FIG.I

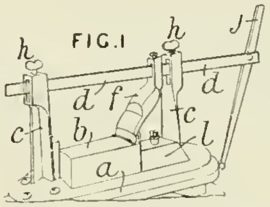
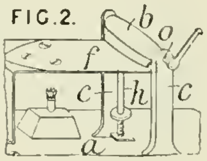


FIG.2.



Finishing.—Relates to a machine for burnishing photographs. The photographs are laid, face upwards, on a convex bed of wood *b*, Fig. 1, attached to a bed piece *a* having standards c, c fixed to it. The lower edge of the cast-iron burnisher *f* is turned concave, case-hardened, and highly polished. The burnisher *f* is attached to a rod *d* passing through slots in the standards and worked to-and-fro by a lever *j*. Set-screws *h* attached to the standards force the burnisher down upon the bed. The burnisher *f* is heated by a lamp *l*. Another form is shown, Fig. 2, in which the burnisher *f* is stationary and horizontal. Over the burnisher *f* is a convex roller *b* revolving upon a shaft *o* in standards *c*, *c*. The picture receives its pressure by a set-screw *a* placed under it. A lamp *l* supplies heat to the burnisher.

2743. Beckett, J. Sept. 16.

Fixing ; toning ; washing.—The toning, fixing, and washing solutions are contained in three small troughs. These troughs have circular bottoms, and carry bearings at their ends in which the axle of a small cylinder fits. The prints are secured over the surface of this cylinder by elastic bands &c. and the cylinder is placed successively in the bearings of the troughs containing the washing, toning, washing, and fixing solutions, and rotated so as to bring the prints into contact with the solutions. Flat surface plates to which the prints are secured by india-rubber bands &c. may be used instead of the cylinder, this arrangement allowing of the ordinary dishes being used instead of the round-bottomed troughs. The bearings on which the cylinder rotates may be attached to a stand arranged to receive a loose trough.

2848. Courtenay, R. H. Sept. 27.

Photo-mechanical printing; negatives for photo-mechanical printing, producing.—Printing-surfaces for line and photographic printing from nature are produced by photography and hydraulic pressure and used to produce plates or blocks which can be printed from by any ordinary press. Collodion, containing silver oleate, and corn-meal or other farinaceous powder are used to prepare a granular negative. A mineral powder, such as powdered glass or pure silex obtained from ammonium or potassium silicate, may be used. A soft-metal plate is prepared with a grain suitable for the intended design and a relief photograph is transferred to it, the gradations of the photograph filling certain portions of the grained plate. A cast is now taken with gutta-percha and electrotyped either solid or backed up with type metal. After the face is cleaned the plate is ready for the press. In producing a transparent positive from the granulated negative, collodion without powder is used. A grained plate with the negative relief transferred to it, or a smooth plate with a grained negative relief may be used instead of the positive transparency. A mixture of gelatine, sugar, tragacanth, starch, and a colouring-matter, usually finely-powdered carbon or liquid Indian ink, is used to obtain a photograph in negative relief from the positive above-described. Ammonium and potassium bichromates and other sensitizing agents may be used for the production of the photograph. To use the composition, a slab of glass is wetted, and paper &c. with its back wetted, is placed perfectly flat on the glass, a solution of the compound is poured on, and the whole is hung up to dry. When dry, the compound is rolled and placed under the positive in the photographic printing-frame or under a negative, if for an intaglio plate, and subjected to the action of light. The print is transferred to a highly-polished type-metal plate. Any other soft metal may be used when the block is to be electrotyped. The plate is placed in warm water so as to wash away the parts not acted upon by the light, and dried, when it is ready to be engraved by pressure. The plate is placed between two highly-polished steel plates upon the bed of a hydraulic press and subjected to great pressure. The photograph is washed out of the plate which is then trimmed and mounted on a block. The photograph for the overlay is similar to the one used to engrave the plate in relief, but it must be printed from a negative. In producing plates from printed matter, a negative is taken as dense as possible and a transparent positive from that negative and so on as before. After the design has been forced into the plate by hydraulic pressure the boldest parts of the work are treated with a solution of potassium bichromate, allowed to dry, coated with strong gelatine and silex, and dried in a warm place in the light so as to render those parts touched with the bichromate insoluble. After washing away the upper part of the gelatine the whole is dried and again submitted to pressure between the steel plates. Iron sulphate, alum, or anything that will render gelatine insoluble may be used instead of the bichromate. The plate is washed in water containing an alkali to remove the photograph and is coated with zinc by electro-deposition. The plate is inked up with a hard smooth roller and treated with a solution of nut galls, phosphoric acid, and gum. If required to print with letterpress, the largest of the lights are cleared in the type metal or lead previous to electrotyping. Plates prepared as described may be used to reproduce engravings, drawings, pen sketches, water colour and other drawings, books, &c. and the production of designs in gold and silver from printed matter.

3069. Ferranti, C., and **Turner, E. J.** Oct. 17.

Re-touching; finishing.—To obtain a dull appearance in the background of the picture, and to throw the portrait into relief, the albuminized or gelatinized paper bearing the photograph is washed with a mixture of ox-gall and water. The background of the picture is then treated with dry colour, "pastil," or crayons, to give a "stippled" effect, and then albumen is applied to the figure and drapery.

3125. Johnson, J. H., [*Rand, A. C.,* and *Waring, J. B.*]. Oct. 23.

Stands. — Stands for rock drills are constructed with four or six legs which are capable of independent movement on the ball-jointed hinges *g*, *h*, &c., Fig. 1. The length of each of the legs E, D, G is adjustable by means of a screw H working in a nut I fixed to the tube E. The is screw turned by a collar K, which is supported

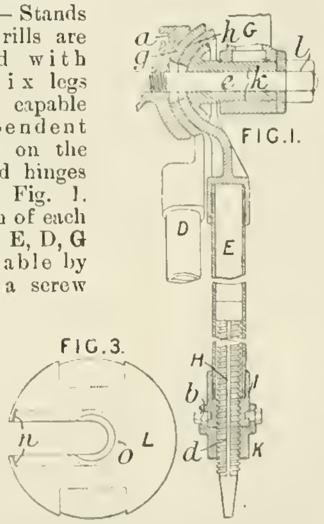


FIG.1.

FIG.3.

on the nut I by pins *b* and is provided with a small key which fits in the groove *d*, and moves the screw H. The hinges *g*, *h*, *k* are secured by a bolt *e* and nut *l*. The legs E, D rest on the ground and are provided with heavy spherical weights to prevent the stand from being displaced by the percussive action of the drill, the leg G being used for supporting the stand from a wall. Fig. 3 shows one of the weights for the legs. The passage *n* leads to a circular cavity *o* in the upper half of the weight L, which slips over a collar on the leg of the stand, and is thus held.

3379. Palmer, J. E. Nov. 13.

Colouring; producing transparencies.—Relates to methods of copying photographic pictures from negatives, and to the colouring and shading in monochrome of the same. A transparent picture of the negative of any desired size is obtained on glass, and coated with a "matt" varnish. The transparency is covered with tracing paper, placed against the light, and a lead tracing is made. The tracing is re-traced on the other side of the paper, and the outlines of the first tracing are rubbed over with grey crayon. The tracing is now placed on suitable drawing paper, and subjected to a slight pressure over the outlines, which reproduces them on the paper. Shading and colouring is now effected with the usual materials, and the paper placed against the transparency, the matt varnish of which acts as a softener to the shading and colouring. If clear varnish is used instead of matt varnish, Reigate silver sand, or Calais sand, is used with it to assist the distribution of the crayon, or powder colours. Other backings for transparencies are produced by making artistic designs in oil, water colour, pencil, steel, or zinc engraving, or stone in stipple, etching, fine grain, landscapes, &c. on canvas, paper, &c., and taking photographic copies of these on albumenized, or plain paper, leaving a white centre to receive the transparency. When albuminized paper is used, it is floated with matt varnish, and plain paper may be treated with size, to receive the colours easily.

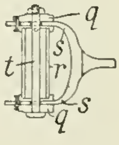
3654. Woodbury, W. B. Dec. 4. [*Provisional protection only.*]

Photo-mechanical printing.—Relates to the production, by photography, of blocks suitable for type-printing, to a method of obtaining the printing-surfaces known as "Woodbury" type, and to a method of printing from such surfaces by machinery. In making a printing-block from a line subject, a relief in gelatine is obtained from a positive photograph. The photograph used in the case of a half-tone subject has also printed upon it lines obtained by interposing between the negative and the plate, a transparent photograph of mosquito netting or Brussels net. The gelatine relief in both cases is impressed upon soft metal by hydraulic or other pressure. The resulting impression may or may not be electrotyped. To obtain "Woodbury" type, the dry bichromatized gelatine film on a glass plate is exposed to daylight for a short time on the side next the glass, causing a thin film of the gelatine to remain insoluble so as to act as a support for the subsequently-impressed photographic image. Tinfoil and a backing of plate paper are placed on the gelatine relief when dry, and the whole is passed through a rolling-press. A composition of shellac and asphalt having been softened by heating, the foil and relief are pressed upon its surface; on cooling, the relief is removed, leaving the tin impression which is used for printing from. In some cases, the shellac composition is impressed, directly upon the gelatine relief. To print from the type by machinery, gelatine reliefs are placed in the space between a soft-metal cylinder and a surrounding iron frame. A spindle being driven into an axial hole in the cylinder, an impression is obtained upon the soft metal. The cylinder and spindle are mounted upon a plate-glass bed and are dragged round by the paper passing under the cylinder. Instead of the plate-glass bed, the printing-cylinder may press by its own weight against a second roller of glass or metal.

3921. Brydon, R., Davidson, J. S., and **Warrington, T. A.** Dec. 26.

Tripod stands for rock drills. Two of the legs are jointed to cheeks *q*, which engage with the ends of the tube *r*. The cheeks are slotted to engage the arms *s*, which form a fork on the third leg. The bolt *t* secures the parts firmly together.

FIG. 5.



A.D. 1873.

615. Abney, W. de W. Feb. 19.

Photo-mechanical printing; printing-paper.—Photographs are printed on sheets of paper coated with gelatine or other gelatinous substance mixed with an alkaline bichromate, and the exposed parts of the films are rendered insoluble in water by exposure to light. Greasy ink will adhere to surfaces prepared in this manner, and the pictures thus formed are transferred to the stone or metal plates of printing-presses. The sheet of paper is floated in a warm solution of gelatine and potassium bichromate, or in a solution of gelatine alone, in which case the paper is prepared, as required for use, by floating it in a solution of potassium bichromate. The paper may be treated by a preliminary washing of gelatine to which has been added a quantity of alum to render the gelatine insoluble, or the paper is coated as first described, the gelatine rendered insoluble by the action of light, and the paper again coated so as to get a fine surface on which the final sensitive film shall rest. A negative is then placed on the paper and, at the parts where the light penetrates the transparent portions, the gelatine is rendered insoluble; the picture, when sufficiently printed, is placed in cold water or in a cold solution of alum or other salt which renders gelatine insoluble, and the greater part of the bichromate is washed out. The paper, when soaked, is placed on a support of zinc, pewter, glass, or other material and dried by blotting-paper in a press or by evaporation. The paper is then coated with transfer or greasy ink by a soft roller such as those described in Specifications No. 3543, A.D. 1869, No. 2485, A.D. 1870, No. 2799, A.D. 1871, and No. 73, A.D. 1872. The ink will adhere only to the portions of the film which have been acted upon by the light. When sufficiently inked, the paper, which may be placed, if desired, in an alum solution, is then dried, and, if any bichromate remains in the gelatine, actinic light is allowed to fall on and harden the surface. By re-damping the film, the picture may be transferred to the plate of a printing-press. If a half-tone negative is employed the paper may be used for obtaining pictures in ink as in the heliotype or other process, both sides of the paper being coated with gelatine. In a modification of the invention, a sheet of paper is coated by gelatine solution to which is added a little alum to harden and render the gelatine insoluble. Inscriptions or designs are formed on the paper with ink composed of a solution of gelatine or gum to which has been added a suitable bichromate and an aniline dye. When dried, the designs are rendered impervious to water by the action of light and are inked by a roller as described and are then transferred to a printing-press. Fine calico, linen, india-rubber sheeting, silk or other similar material may be used instead of paper.

686. Bolton, F. J., and Webber, C. E. Feb. 24. [*Provisional protection only.*]

Photometers.—Relates to a method of and apparatus for obtaining photometric measurements. The principle applied in the construction of the apparatus is "that certain bodies when exposed to "light of greater or less intensity become changed "in their electrical conductivity or resistance." The body to be acted upon by the light is placed in an electric circuit together with an electrometer or other electrical resistance measurer. The light being directed on the body, the measurement of the electrometer is taken as a measurement of the intensity of the light. The comparative transparency or density of translucent substances can be measured by allowing the light to pass through them before it is directed on to the body in the electrical circuit.

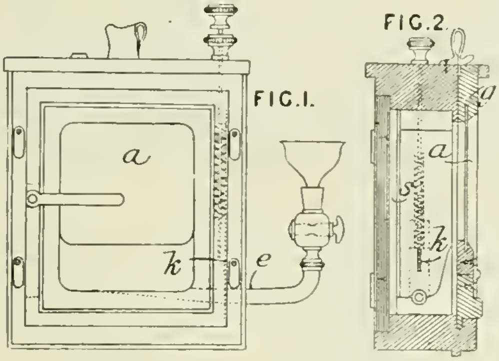
775. Long, J., Forsyth, A., and Griffiths, J. R. March 4. [*Provisional protection only.*]

Finishing.—A vignette or a whole or part figure is printed in the ordinary way and is then placed in the printing-frame under a glass or the like prepared with a stippled surface or "effect." Parts not to receive the "effect" are suitably shaded. After fixing and toning, the stippled parts of the print are rubbed with pumicestone or other abrading powder.

1190. Browne, A., [*Despaquis, P. A.*]. March 31. [*Provisional protection only.*]

Re-touching; enlarging; printing.—A finely-ground glass plate, on which the image is thrown by the enlarging camera is retouched to remove the defects appearing in the image. Photographs are then printed by placing the sensitized paper or glass plate in contact with, or nearly in contact with the retouched plate. Instead of a ground glass plate a transparent plate may be used covered with a sheet of paper &c. which can be removed after the plate has been retouched and before printing, it being necessary only that the image should be clearly visible and that the surface should be suitable to receive the retouching medium.

1333. **Stein, S. T.** April 10.



Dark slides; sensitized plates; developing.—The processes of sensitizing the plate and developing it are carried out within the dark slide, so that the use of a dark room is unnecessary. After the picture has been focussed the dark slide is removed and the plate *s* is placed therein in the position previously occupied by the focussing screen. The plate *s* is coated with albumen and dried and is covered with iodized collodion immediately before use. To sensitize the plate, silver nitrate solution is poured in through the funnel *e* and the slide moved about to distribute the solution over the plate, the process being watched through the yellow glass *a*. When the sensitizing operation is complete the solution is drained off, by turning the funnel downwards. On removing the funnel the aperture is immediately closed by the spring slide *k*. When the slide is inserted in the camera the frame *g*, carrying the yellow glass *a*, is drawn up and the plate can then be exposed. When the exposure has been made the frame *g* is closed down, and the slide forms a cell into which the developer, pyrogallic acid or ferrous sulphate, is introduced in the same manner as the sensitizing solution. After developing and washing the plate is taken out and fixed with sodium hydrosulphite in the usual way.

1341. **Billups, J. E.,** and **Lee, E. P.** April 12.

Enamels; transparencies; colouring.—In order to produce a permanent picture a photograph is transferred to glass, or a transparency is produced on glass, and then fired, so as to burn it in. The photograph may be coloured by applying vitrifiable colours and fixing them by firing.

1449. **Billups, J. E.,** and **Lee, E. P.** April 22.

Ornamenting by photography.—Relates to a method of producing permanent coloured and other photographic pictures or the like on porcelain &c. A photographic transparency is transferred to, or produced on, the surface of the porcelain which is then placed in a furnace, and the photograph is burnt in. Permanent coloured photographs on porcelain are produced by applying vitrifiable colours to the porcelain with the photograph on, and then burning the colours into the porcelain.

1954. **Woodbury, W. B.** May 30.

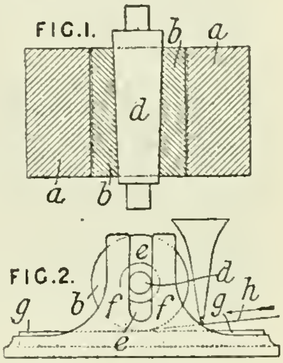


Photo-mechanical printing; sensitized plates and films.—Relates to a method of obtaining, by photography, type-printing-blocks from subjects in half tone only. A Woodbury-type sheet of bichromatized gelatine is exposed under a photographic positive with a transparency of netting interposed. The transparency may be an impression from a grained stone or from fine ruled lines. This sheet of gelatine, when washed, gives a relief having the positive photograph represented by a number of lines, and an impression of this in soft metal is used for printing in a type press. Or a negative of the network is copied with the negative to be reproduced, yielding a lined positive from which a relief and blocks are made as above. Another part of the invention relates to means for simplifying the process known as Woodbury type. The side next the glass of a bichromatized gelatine film is exposed to daylight for a few seconds before exposing it under a negative, and a sheet of tinfoil is attached by gum to the edges of the relief thus obtained. A sheet of plate paper is laid on the back of the tinfoil and the whole is passed through a rolling-press. The foil is thus pressed into all the details of the relief; the foil and relief are then backed up by pressure with a composition containing shellac and asphalt, or lac and sulphur, or lac and Venice turpentine, or lac or resin and silica. When the composition has hardened, the tinfoil adheres to it, and the gelatine relief is removed from the mould and the mould printed from. For obtaining Woodbury type by mechanical means, the gelatine reliefs are inserted between the interior of an iron block *a*, Fig. 1, and a soft metal cylinder *b* which fits loosely in the block. The cylinder is expanded by a tapered spindle *d* driven into it, thus forcing the soft metal to take the impression of the relief. The spindle forms a shaft for the cylinder to be used in printing; it is mounted in vertical slots *e*, Fig. 2, in a frame *f* which is provided with a bed *g* of plate glass or a fixed roller on which the paper to be printed rests.

2011. **Willis, W.** June 5.

Printing; printing-paper. — Surfaces of paper, wood, &c. are prepared for receiving a photographic image by coating them with simple or compound salts of platinum, iridium, or gold, with salts of silver, lead, mercury, or other metals, and finally with a solution of ferric oxalate or tartrate, or a combination of these with other salts. The salts mentioned as applied in the first coating are potassium platinochloride, sodium platinochloride, or platinum bromide. For the second coating, silver or lead nitrates are used in solution, and for the third it is preferred to use a solution of ferric oxalate in the least possible quantity of oxalic acid. After exposure to light under a negative until a faint brown image has appeared, neutral potassium oxalate or other suitable oxalate solution is applied to the surface, which changes the brown tints to black. The surface is then washed in a dilute acid and in water, but may, in some cases, be washed in a solution of sodium chloride, hyposulphite of soda, ammonia, or other suitable salt. The order of the coatings may be varied, or the salts, in solution in water or other solvent, may be mixed before their application to the surface.

2079. **Frèret, L.,** [*Godard, P. M.*]. June 12.

Ornamenting by photography.—Porcelain, delftware, biscuit or enamel ware is ornamented by applying a photographic film to it before baking. A negative is produced from a picture, landscape, &c., and a print is made from it on paper prepared with a heated bath consisting of a solution of glycerine water and colour, pure gelatine melted in a water bath, and a solution of bichromate of potash. The print is placed in cold water until well soaked; it is then applied to the surface of the pottery, and the whole placed in warm water. The paper soon detaches itself, leaving the film on the pottery. The bichromate of potash renders the gelatine insoluble after being exposed to light, so that the exposed parts of the gelatine will be fixed to the porcelain and the unexposed parts will be dissolved away, leaving a picture of the negative on the pottery. The picture is then covered with enamel or vitreous glaze and baked.

2122. **Hodgson, E.** June 16. [*Provisional protection only.*]

Cameras; change-boxes.—A hollow drum, or a skeleton frame of the shape of a polygonal prism, has top and bottom discs in which grooves are cut for the insertion therein of any convenient number of prepared glass plates on which pictures are to be photographed. The ground-glass focussing-plate forms one side of the frame, the other sides are occupied with the prepared glass plates, each of which may be brought, in succession, by the turning of the drum, into the exact position previously occupied by the focussing-glass. The drum is pivoted in a box, so that it can be freely revolved by a handle outside the box. The box is provided in front with a sliding lens, directly opposite to which is a small strip of yellow glass to protect the plates when focussing or when turning the drum. By the aid of a circular dial on the top of the box, the plates are brought successively before the lens and thus receive an impression or picture. When only one or two plates are required, the drum may be only a quadrant, and the views as they are taken are turned into an empty space. In the case of a stereoscopic camera, the drum is made to revolve on a horizontal axis.

2263. **Lake, W. R.,** [*McKean, J. A.*]. June 30.

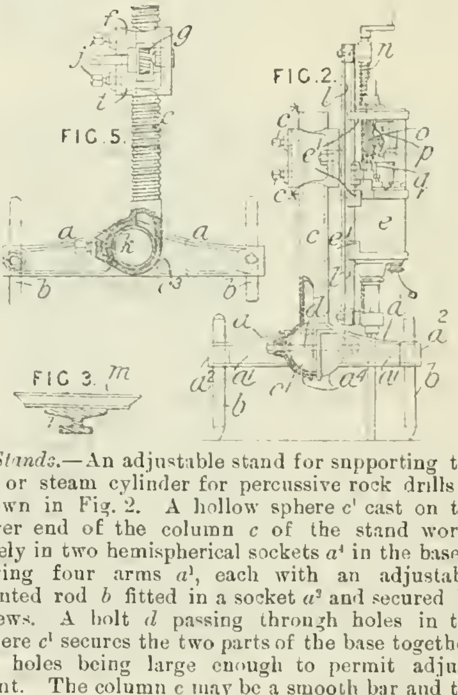


FIG. 3.

Stands.—An adjustable stand for supporting the air or steam cylinder for percussive rock drills is shown in Fig. 2. A hollow sphere c^1 cast on the lower end of the column *c* of the stand works freely in two hemispherical sockets a^4 in the base *a* having four arms a^1, each with an adjustable pointed rod *b* fitted in a socket a^3 and secured by screws. A bolt *d* passing through holes in the sphere c^1 secures the two parts of the base together, the holes being large enough to permit adjustment. The column *c* may be a smooth bar and the cylinder is then secured to it by clamping screws $c^{\times}$. In large machines, the cylinder is attached to a sleeve *f*, Fig. 5, provided with a toothed pinion *g* gearing in a circular or spiral rack on the column *c*, the sleeve being secured by a pinching-block *i* and screws *j* after adjustment. A pawl engaging with the teeth of the pinion *g* prevents accidental slipping of the sleeve. In a modification, a boss c^3 at the lower end of the column *c* is adjustably fitted on a cross-bar *k* connecting the two halves of the base. Flanges e^1, Fig. 2, cast on the cylinder *e* slide freely on a bar *l* shaped as shown, and the cylinder is operated by a feed-screw *n* passing through a screw nut secured between two brackets on the cylinder. A faceplate *m*, Fig. 3, formed on the bar *l* is held by screws with V-shaped heads in a socket on the sleeve so as to form a swivelling joint.

2347. Tenac, C. L. van. July 7. [*Provisional protection only.*]

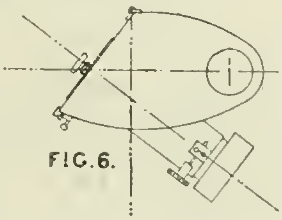


FIG. 6.

Lamps, actinic; lamp reflectors; enlarging.—Relates to an apparatus for the magnified projection in their natural colours of small opaque bodies, and stated to be applicable for producing "enlarged negative plates direct from the subject." The arrangement consists of a light placed at the focus of an internally-polished shell forming a system of reflectors, and a projecting tube containing optical glass, arranged at an angle of 45° with the axis of the reflector. The plane of the body to be projected is perpendicular to the axis of the projecting tube, as shown. The reflectors may be of different shapes such as ellipsoidal, ellipsoidal and conical, or cylindrical parabolic, and conical, or cylindrical, and may be fitted as a globe to oil, gas, oxyhydrogen, or arc lamps. Magnesium light can be used by providing proper ventilation and a glass to prevent the smoke from interfering with the result. Two reflectors may be combined so as to fit on two lamps.

2468. Banks, J. H. July 17.

Photo-mechanical printing; chromo-gelatine processes.—Relates to a method of producing a plate with a raised surface applicable for printing in a copper-plate or lithographic press. The plate may be flat, or may be cylindrical for printing on calico, &c., and may be used as a seal, hand-stamp, or as a plate for embossing book-covers or leather, &c. A negative of a drawing, letterpress print, or any picture, &c., is obtained upon a sheet of glass and is developed with successive solutions of mercuric chloride, potassium iodide, and ammonium sulphide, each of which is washed off with cold water. A second glass sheet is then prepared by dissolving gelatine, "chondrine," or best French or Russian glue in cold water and pouring the warmed solution on the horizontal plate of glass, which is dried and sensitized by being placed for a few minutes in a bichromate or peroxide of chromium solution containing a little lime. When dried again the plate is placed on the negative which is placed on the plate-glass front of an ordinary pressure frame, and covered with black velvet, and the whole is exposed to white light from five to twenty minutes. The printed portion of the gelatine forms an insoluble compound, and the white portion is brushed away in a hot saline solution. The design left on the glass is hardened in a bath of acetic acid and a plaster cast is made from which a second plaster cast is taken. Instead of using a hot saline solution, a cold solution of iodine or potassium iodine, followed by a weak solution of ammonia, may be used. The sunk portions of the cast may be deepened by a gouge or by rolling a mixture of printing ink and copal or varnish over the raised parts of the cast, which, when dry, is immersed in a weak soap solution, the unprotected plaster being removed by a soft brush. The plaster is then hardened by a solution of pyrogallic acid and alum. For stereotyping purposes the soap solution is not used, and the plate is hardened by a solution of hot size, treacle, and peroxide of chromium, and is then exposed to light. The plaster of Paris is then poured on, and just before setting is subjected to pressure. For an electrotype, the cast from the gelatine film is soaked in cold water and is afterwards warmed by a gas flame. Hot wax mixed with resin and lard is then poured on the cast, and the impression thus made is polished with black lead and washed with alcohol, and when nearly dry, fumes of mercury are allowed to settle on the face, which is thus prepared for copper plating. To produce a copperplate similar to a copper-plate engraving, a negative with lights and shades reversed is used in the same process, the surface being raised with acetic acid only. Instead of the negative a print may be placed on the gelatine film. The Provisional Specification states that cement, gutta-percha, wax, or other material may be used instead of plaster of Paris; that the plaster cast, being washed with turpentine, may be used as a printing-surface; and that the wax moulds may be obtained by hydraulic pressure.

2592. Beckett, J. July 31. [*Provisional protection only.*]

Printing-paper.—Paper for printing is coated with albumen solution on both sides at once, by immersion or floating.

2763. Edwards, W. H. Aug. 21. [*Provisional protection not allowed.*]

Mounting prints.—Sheets of cardboard are coated with a solution of gum, gelatine, starch, &c., allowed to dry, and cut into the sizes required. The photographs are taken from the water in which they have been soaked for the purpose of fixing, and are pressed upon the cards so prepared.

2911. Haseltine, G., [*Critcherson, G. P.*]. Sept. 4. [*Provisional protection only.*]

Finishing.—Relates to method of burnishing photographic pictures. The picture is placed on a steel burnishing bar, which is placed over a plate mounted on a stand and is heated by a gas-jet &c. placed below the plate. The picture is moved to and fro on the bar by a pressure roller mounted on a shaft carried in adjustable bearings having set-screws and springs &c. for regulating the pressure of the roller on the back of the picture. The top surface of the burnishing bar is polished and the surface of the roller is roughened.

3106. Barraud, H. Sept. 22. [*Provisional protection only.*]

Sensitized films ; producing photographs of special character.—To give to photographs the appearance of a line or stippled engraving, an impression is made upon the sensitized surface by a plate or stone suitably engraved or otherwise treated. The ground thus obtained and the colour of ink or pigment in which it is printed may be varied to suit the picture or different parts of the picture. The ground may be applied after the picture is fixed by printing from a plate or stone, or by transferring an impression from a sheet of paper to the parts of the picture which require the treatment.

3176. Newton, A. V., [*Teysonnière, A.*]. Sept. 30.

Printing.—For printing on fabrics from photographic plates, the fabrics are prepared by immersing them in a mixture of logwood extract, chromic acid or one of its salts, and aniline black or blue black, soluble in water. The aniline black is composed of nitro-benzene, aniline, and iron filings, copper filings, and hydrochloric acid. The mixture is capable of being acted on by light.

3288. Sell, E. E. J. Oct. 10.

Lamps, actinic.—In order to take photographs at night, an ordinary petroleum lamp having a circular wick and containing carbon bisulphide instead of oil is used. The chamber containing the carbon bisulphide is surrounded with water. "Peroxide of nitrogen" contained in a metal or glass &c. gasholder lined with asphalt, is led to the centre of the wick and is mixed with the carbon bisulphide by impinging against a cone placed with its apex downwards within the wick. A stop-cock is used to regulate the pressure of the "peroxide," and a reflector is used to direct and condense the light.

3449. Clark, A. M., [*Gaiffe, E.*]. Oct. 23. *Drawings to Specification.*

Photo-mechanical printing.—To produce the printing surfaces upon the copper or other metal cylinders used in printing coloured illustrations, labels, headings, &c., a photographic proof of the design for one colour is first obtained, from which a steel plate in relief is then produced by a photographic process. The steel plate is touched up with a graver and hardened. By means of the clamming machine used in engraving cylinders for calico printing, a counterpart is obtained on a steel roller, which in turn serves to reproduce the design on the printing cylinder. The other cylinders are similarly prepared with their corresponding colour designs.

3782. Kennett, R. Nov. 20.

Sensitized plates and films.—Relates to the production of an emulsion for photographic purposes in a solid condition, and consisting essentially of gelatinous matter in combination with silver nitrate and potassium bromide, cadmium bromide, or ammonium bromide, or with the chloride or iodide of these metals in combination with the bromides. To prepare the emulsion Nelson's gelatine or other gelatinous matter is dissolved in hot distilled water and mixed with a solution of potassium bromide ; a solution of silver nitrate is then added. The emulsion is poured into shallow dishes to cool, cut into strips, and washed with water until the free potassium bromide and nitrate are dissolved out. It is then dried in flat dishes upon hot water boilers, cooled, and placed in racks in a drying-closet in which dry air, either warm or cold, is circulated. The drying-in dishes may be omitted. The brominized or chloridized gelatine may be dried without the silver nitrate, and sensitized when used. The emulsion is dissolved in warm water before its application to the plates.

3901. Lake, W. R., [*McKean, J. A.*]. Nov. 28.

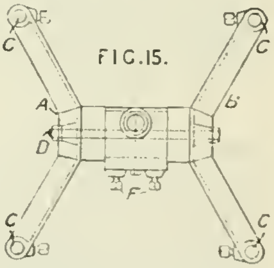


FIG. 15.

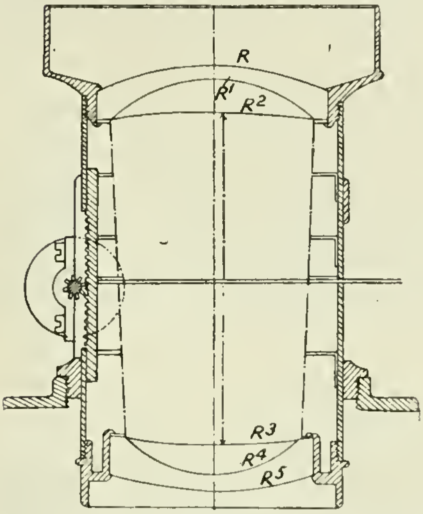
Stands for rock drills are constructed with two parts A, B having legs or supports C and fitted together at the centre and secured by a bolt D. A column, upon which the machine is mounted, has a boss which is fitted upon a central tubular bar formed by the inner or adjacent portions of the parts A, B. The boss turns on this bar and may be secured in position by pinching-screws F.

3938. Johnson, J. H., [*Muhé, H.*]. Dec. 1. [*Provisional protection only.*]

Finishing.—Photographs are burnished or glazed by a roller press heated by a lamp. The press consists of a roller provided at each end with a collar which rotates in contact with the surface of a table so as to prevent undue pressure upon the photograph. The table is hinged at one end, and is supported at the other end by helical springs on adjusting-screws. A recess is made in the table beneath the roller to receive a polished burnishing strip of steel, glass, porcelain, or other substance capable of sustaining the heat of the lamp.

A.D. 1874.

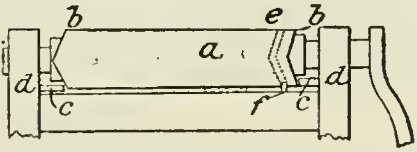
1124. Wirth, F., [*Steinheil, A.*, and *Steinheil, E.*]. March 31.



Lenses.—Two compound lenses are employed, each compound lens consisting of two parts cemented together, and placed at an adjustable distance from the other compound lens. The two exterior lenses are made of flint glass, and the two interior of crown glass. The interior surfaces R², R³ of the compound lenses are of equal, or nearly equal, curvature. The external surfaces R¹, R⁴ of the crown glass lenses are of unequal curvature, the surface R⁴ having the greater curvature; while of the external surfaces R, R⁵ of the flint glass lenses, the surface R has the greater curvature.

1481. Lake, W. R., [*Bass, J. B.*]. April 28.

FIG. 2.



Finishing.—A slight longitudinal reciprocating motion is given to the feeding rolls *a* of a machine with fixed burnishers, described in Specification No. 2684, A.D. 1872, by pins *c* attached to standards *d* engaging with cam surfaces *b* cut at each end of the roll, or by fixed pins *f* engaging with a grooved cam *e* on the periphery of the roll. According to the Provisional Specification, the burnishing tool consists of a polished metal bar, strip of glass, &c. fitted in a groove in the supporting frame so as to be easily removable.

1634. Clark, A. M., [*Lambert, C. L.*]. May 8.

Re-touching; printing.—In the re-touching of negatives, whether they are taken from nature or are enlarged reproductions, the negative, after being fixed and finished, is covered on both sides with thin paraffin paper, preferably of the grain known as "papier pelure végétal," or other transparent material. The re-touching is effected on either of these two surfaces by applying, where necessary, a fine powder by means of a stump &c., the sharpness of the lines being restored by a blacklead pencil. A positive image is then obtained on sensitized paper prepared with salts of either silver or chromium by means of a printing-frame. If the lines of the primary plate are too strong, a sheet of very thin glass or other transparent material may be interposed between the negative and the paper during the last part of the time of printing. The complete or partial transformation of the background as well as modifications of draperies &c. may be effected by placing on the positive a very thin glass plate on which the outline of the subject is traced about a twenty-fifth of an inch from it, and another glass is then placed on a mask of yellow paper. This process may be applied to transparent positives of all dimensions, which will then serve for the reproduction of negatives without further re-touching.

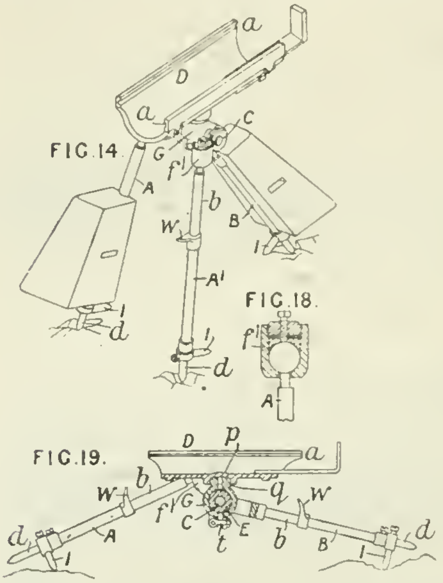
1718. Johnson, J. H., [*Waring, J. B.*]. May 14.

Tripod stands.—A tripod for supporting a rock-drill cylinder stand D, Figs. 14 and 19, is supported on three legs, each formed of an external tube *b*, within which a rod *d* may be adjusted and secured by a set-screw. The upper end of the leg B is forked and secured by a bolt C to a cylindrical frame E forming the top of the tripod, and having two arms f^1 with which the legs A, A¹ make ball-and-socket joints, Fig. 18. A circular recess *p* in the stand D fits over a circular projection *q* formed partly on each of two clamps G embracing the frame E. The stand D may thus be rotated laterally to any position and secured by tightening the bolt *t*. Adjustable spurs *l* are fitted to the rods *d* for supporting the legs when outstretched to lower the stand, and weights are hung on the hooks *w* when the drill is working. These weights are grooved to rest against the tripod leg.

FIG.14

FIG.18.

FIG.19.



1807. **Placet, P. E.** May 21.

Photo-mechanical printing ; sensitized plates and films ; chromo gelatine processes.—To obtain grained engravings or designs, an animal or vegetable substance, which has been exposed to light under a photographic positive or negative, is dipped into a solvent and then into a liquid having a tanning or contracting property, thus covering the surface of the substance with the required grained design. In certain cases, the solvents and tanning substances may be employed in the form of powdered solids. In one method, bichromated gelatine paper is exposed to light under a negative, and then dipped into a saturated potassium bichromate solution, and the excess of liquid is removed by a cloth or blotting paper. It is then plunged into an aqueous solution containing iron sulphate and acetic acid, and afterwards dried. A reverse proof is obtained on the reverse side by placing the gelatine paper after exposure with its exposed side on another surface and successively immersing the paper in the two solutions. To develope a carbonized gelatine proof, it is immersed before treatment with the bichromate and iron sulphate solutions for some time in ammonia solution and in a solution of potash, calcium hypochlorite, or other solution capable of dissolving the gelatine. The gelatine used may be run over plates of glass or metal and then sensitized, or it may be dried and sensitized. Gums, albumen, dextrin, isinglass, sugar, caramel, glucose, casein, starch, gluten, juices, bitumen, soaps, resins, &c., or mixtures of two or more of these, may be used instead of gelatine, or the gelatine may be mixed with gum, albumen, &c., or with soluble gelatine obtained by treating ordinary gelatine with an acid or by prolonged boiling. Salts of gold, silver, and other metals, and certain animal and vegetable substances, may be added to the materials to render them sensitive to light. Instead of the gelatine paper, a mixture of gelatine, soluble gelatine, water, sugar, and potassium bichromate, with or without a small quantity of chromic, acetic, citric, or other acid, is used, the mixture being poured upon a plane surface and allowed to dry. After exposure, the proof is dipped into pure water, or water containing borax &c. and is developed and grained. To stay the action of the liquid, the proof is plunged into a bath containing water, alcohol, and ammonia, and is then wiped with blotting paper and dried. The proof is finally immersed in the iron sulphate solution, washed and dried. The grained designs may be used as photographic proofs.

1935. **Dillon, T. A.** June 4.

Copying documents.—To obtain printers' copies of documents, they are arranged in a case, flattened down by means of a sheet of glass, and photographed. Microscopic copies may also be obtained for subsequent enlargement when needed. To preserve metallic facsimiles of original documents, the photographic copy may be impressed into thin brass or other metal plates by any photo-mechanical process.

2085. **Sturgeon, T.,** and **White, W. G.** June 16. *Drawings to Specification.*

Tripod stands for rock drills. A spherical part on the steam &c. cylinder of the drill fits into a strap-piece, to form a ball-and-socket joint, the strap-piece being tightened by a nut and having three legs jointed to it, for use in vertical drilling ; for horizontal drilling, however, one of the legs is removed from the strap to the back portion of the machine. The legs have pointed feet and carry discs or plates which rest on the ground, and may be covered with loose stones &c.

2490. **Debenham, W. E.** July 16.

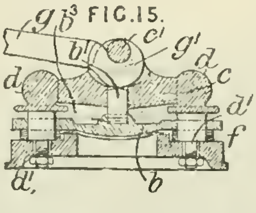
Colouring ; enamelling.—Colours are fixed on photographs or on drawings made with crayon powder, liquid, or water colours, by immersion in a solution of gluten in alcohol, or of gelatine or the like in water, with as much alcohol added as the solution will bear without precipitating the gelatine. The gelatine may be rendered insoluble by treatment with tannin or chrome alum, which is afterwards exposed to the light. In some cases the solution may be allowed to flow over the picture. In order to prepare a photograph or drawing so that colour may adhere, either of the above alcoholic solutions is used, or a solution of glycerine or sugar, or a mixture of any of these. If the drawing can be coloured before being mounted, the solution is preferably applied to the back of the paper, the alcohol causing it to penetrate to the front. The fixing solution may also be used for attaching the picture to the collodionized glass used in enamelling.

2617. Lester, T. July 27. *Drawings to Specification.*

Cameras; sensitized plates; developing; fixing.—Consists in the application to a camera of a box containing three parallel baths, into which a collodionized plate may be successively plunged without exposure to daylight, and then transferred to a plate box and finished at leisure. The first bath contains nitrate of silver for sensitizing the plate, the second, protosulphate of iron, acid, and sugar for developing it, and the third a mixture of honey, iodide of potassium, and water for washing the developed picture. The plate is plunged into the baths by means of a dipper, which holds the plate at one edge, and is passed through a slot formed in the upper part of the body of the camera, which slot is covered by a slide with an aperture for the admission of the dipper. The glass plate can be held firmly in the dipper by one edge, by means of a clamp screw pressing against a stay at the lower end of the dipper. A stop on the end of the dipper cuts off light. The bath box is fitted to the camera by means of a slide, which is screwed on to its lower edges and works in a groove in the top of the bath box.

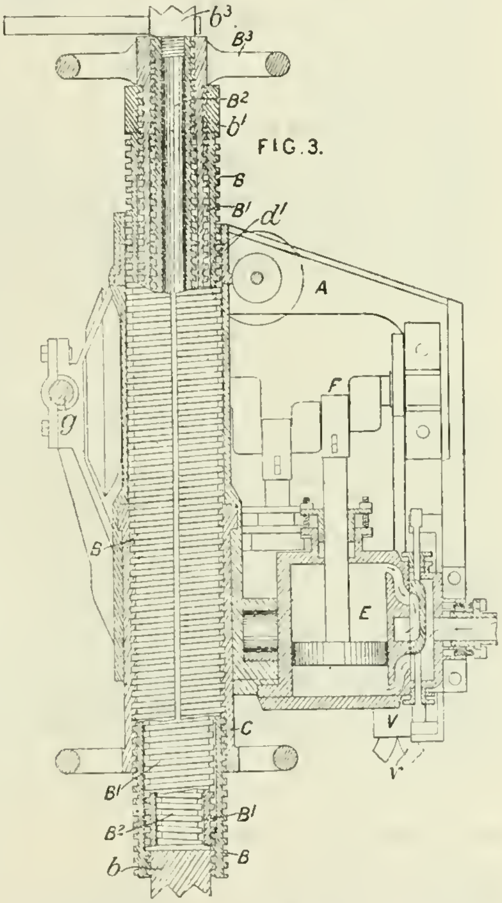
2667. Brooks, A. G., [*Farjon, L. A.*]. July 31.

FIG. 15.



Embossing photographs.—In a stamping press used for embossing or giving a convex or concave surface to photographic cards, the moving plate or platen b is forced upon the card by the action of the eccentric head g^1 of the hand-lever g upon the piston b^1. The cross or pressure bar c in which the piston b^1 works, and upon which the pivot-pin c^1 of the lever g is fixed, is attached at its ends to heads d formed upon the upper ends of the two holding-down bolts d^1. The platen b slides upon enlarged parts of, or upon tubes surrounding, these bolts, and is thrown upwards, when pressure is removed, by the spiral springs f. Elastic packing is introduced between the piston b^1 and the platen b. The press may be provided either with a single or with a double platen, the raised parts being either oval or rectangular in shape.

2728. Tregay, W. Aug. 6.



Stands for rock drills. The machine frame A is fitted, and free to turn, on a female screw C, which may travel on the outer screw section B of a telescopic stand, so as to raise or lower the machine. The part B carries a shoe b to fix in the rock and a nut b^1 to receive the section B^1, in the upper part of which works the section B^2 carrying another shoe b^3. By turning the hand-wheel B^3, the sections B^1, B^2 are extended simultaneously. In some cases, the shoe b may be removed, the stand being screwed on a foot bolted to a pedestal or trolley. The frame A may be turned on the stand by a worm-wheel rotated by a hand-wheel and gearing with a toothed collar d^1.

2741. Haseltine, G., [*Thurston, R. H.*]. Aug. 7.

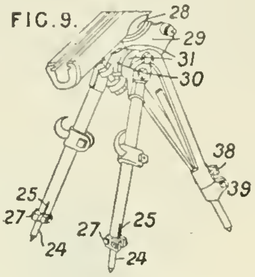


FIG. 9.

Tripod stands for rock-drilling and like machines are constructed with bars 24 sliding in or through the legs and held, when adjusted, by screws passing through lugs 27 on each side of slits 25, or by set-screws 38 and removable clamps 39. A screw clamp 29 binds on a stud 28 projecting from the machine bed, and a similar clamp 30 made in one with it embraces a cylinder made fast to the tripod, a universal joint being thus formed. The cylinder is formed of piping, its ends being capped by the socket 31 of the tripod, within which the cylinder may revolve; the sockets and pipe are kept in position by bolts.

3541. Cleary, W. Oct. 15. [*Provisional protection only.*]

Finishing.—Photographs are polished or glazed by passing them between a revolving cylindrical roller and a burnishing bar having a reciprocating motion in the direction of the axis of the roller. The surface of the roller is "draw filed" in the direction of its length. The burnishing bar is mounted in slides underneath the roller, and receives its reciprocating motion from a cam on the axle of the roller which is revolved by hand. The steps in which the axle of the roller revolves are provided with screws for giving the required pressure, and the machine is heated by a gas or other lamp.

3616. Francis, G. Oct. 21.

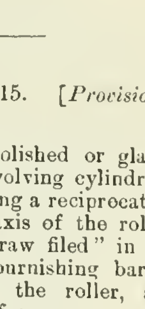


FIG. 6.

Tripod stands for theodolites or angle-measuring instruments. The instrument, when in use, is fixed on the stand by means of a bevelled or dovetail projection j^1, which is formed on a revolving table j connected to a ball-and-socket joint x, x^1, so that it can be turned down at right-angles, as shown, for enabling the instrument to be used for taking vertical angles. The instrument may be screwed to the top of the ball-and-socket joint, in which case the socket is grooved to allow the neck and table to be turned down, and the joint is split vertically and clamped by a screw. In the joint shown, the socket is formed in two parts which screw together to clamp the joint. The tripod, when closed, is round, and may be used as a walking-stick, the upper part being covered with a metal cap.

3633. Clark, A. M., [*Lambert, C. L.*]. Oct. 21.

Chromo-gelatine processes; intensifying; mounting prints. — Permanent carbon photographs are produced with salts of chromium, in their true aspect and "gelatinized at the same operation." A glass plate first receives a greasy coating, then a layer of normal collodion, and is immersed in cold water. The pigmented papers are then removed from their printing frames and one is applied on the coated glass plate whilst it is in the bath. The plate and paper are removed and subjected to slight pressure. The positive print is developed in warm water, being sufficiently exposed to serve as a picture to be seen by reflected light. The developed print is immersed in gelatine solution and the card mount is applied thereto in the bath. When the picture is dry, it is detached from the glass and is brilliant and glossy. Mica may be employed instead of glass; after development of the print on the mica a sheet of white or coloured paper is pasted at the back and it is then mounted on card. Chromo-gelatine photographs, either positive or negative, are strengthened by applying an aqueous solution containing ammonia, sugar, and permanganate of potash. Carbon prints may be mounted on cards ornamented by borders printed from a negative with silver salts, the spaces for the carbon prints being marked during the operation. Borders may, however, be lithographed on paper of varied or graduated tint. To give a fleshy appearance to bust portraits, a graduated flesh tint is applied over about two-thirds of the oval before applying the portraits. A tinted powder may be applied at the back of a gelatine photograph to impart opacity to parts which require darkening.

3740. Sawyer, J. R. Oct. 29.

Chromo-gelatine processes.—A temporary support to serve during the development of the image obtained on a sensitized pellicle of gelatine and carbon, is prepared with a surface which is adhesive while moist, and in that state, holds the picture, while this can be stripped off when dry. When made of paper, the temporary support is coated with a solution of gelatine containing chrome alum; when dry, it is pressed powerfully by rollers or by hydraulic pressure. The sheet of gelatinized paper is next coated with an aqueous solution of shellac or other lac, made by digesting the lac with borax and carbonate of soda, and is then dried and pressed. The surface is then made repellent to water by rubbing it over with a solution of resin and white wax in turpentine. The prepared surface of the support is brought into contact with the surface of the print under water. After drying, the support and print are together immersed in warm water and the paper is skinned off. The print is then developed, rinsed in cold water, placed in a solution of alum, then in cold water, and is transferred to its final support under water, the surface of the final support being prepared with an adhesive preparation. When dry, the temporary support is stripped from the finished picture. According to the Provisional Specification the lac solution may be applied to cardboard, metal, glass, porcelain, earthenware, or slate.

3947. Despaquis, P. A. Nov. 17.

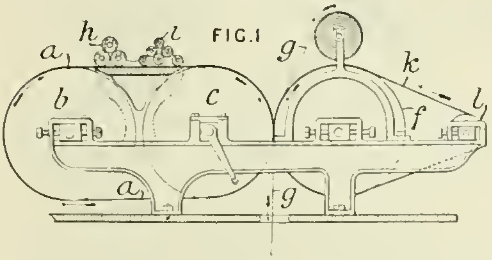


FIG.1

Photo-mechanical printing.—In lithographic processes, such as the Poitevin or Albertype, in which bichromatized gelatine is used, the parts which are to take the ink are rendered insoluble while the white parts absorb water. The water, however, may penetrate to the layers of gelatine underneath the black parts, in which case the surface is liable to be torn from its support. To avoid this, the plate, after printing under the negative, is exposed to sunlight from the back so as to render insoluble all the gelatine behind the dark and half-tone parts. According to another method, the plate is coated with a layer of albumen, which is rendered insoluble, and then with a film of bichromatized gelatine so thin that printing under the negative renders the dark parts insoluble down to the surface of the albumen. In another process, a layer of bichromatized gelatine is exposed under the negative and then wetted "so as to lift up at the "surface only of the layer the bichromate which "is in the shades of the image." The plate is then inked to test whether the bichromate is sufficiently lifted up, and then "all the plate is left "to be acted on in mixing the water of the surface "with a little glycerine, which maintaining a certain "humidity on that surface prevents the gelatine "from becoming insoluble in that part, whilst all "the part in the bottom becomes completely in-"soluble." Instead of damping the plates with a sponge, a roller of porous stone or Passy brick is employed. For preparing printing-plates of gelatinized cloth, flax or hemp cloth is used. The threads of the cloth are prevented from swelling by covering them with bichromatized albumen, which is rendered insoluble. Fig. 1 shows the press used for printing. The gelatine film is carried by the belt *a*, made of cloth or of zinc or other flexible metal. The belt *a* travels round rollers *b*, *c*, carrying the film under the damping-rollers *h* and inking-rollers *i*, and bringing it in contact with the paper *g* supported by the backing roller *f*. An endless cloth *k* of flax or zinc passes round the roller *f* and the tension roller *l*; this cloth also may carry a gelatine printing-film.

4011. Stahlschmidt, J. C. L., [*Braun, A. H.*]. Nov. 21. [*Provisional protection only.*]

Colouring; mounting prints. — For producing pictures in imitation of oil paintings, a carbon print is transferred to papier vegetal, and the back of the print is coloured with either oil or water colours, or by means of chromo-lithography. The coloured picture is then mounted by means of glue &c. upon canvas &c., and the front is retouched and varnished.

A.D. 1875.

241. Furrell, E. W., [*Browne, J.*]. Jan. 21.

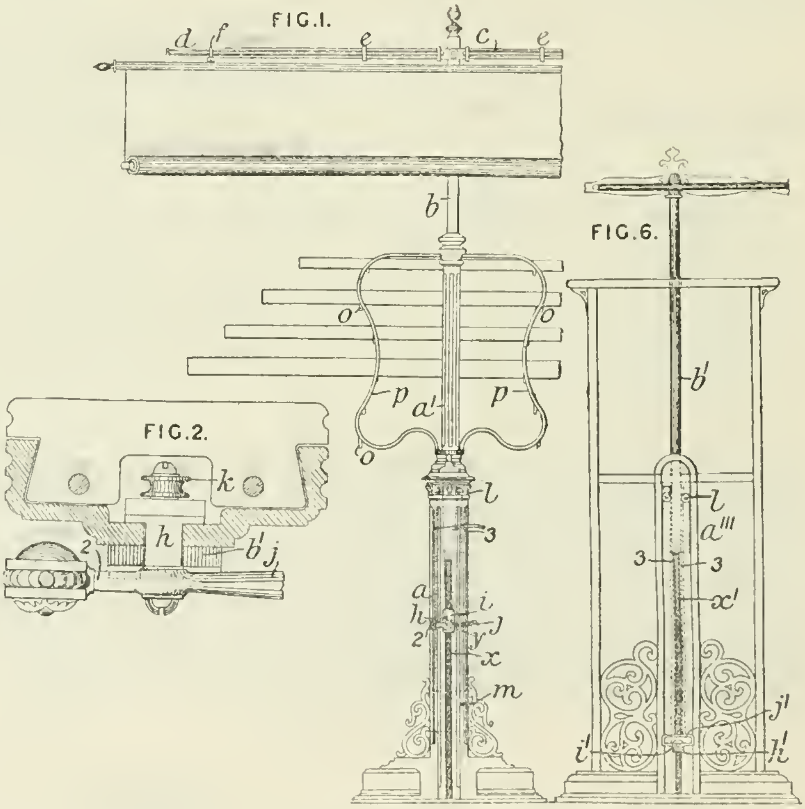


FIG. 1. FIG. 2. FIG. 6.

Stands for suspending maps and charts, blackboards, &c. In the arrangement shown in Fig. 1, the map &c. is hung by hooks *f* from bars *d* which may slide outwards by means of rings *e* on a cross-bar *c* to extend the width of the stand. By applying clips to the supports *f*, drawings, tracings, photographs, and other illustrations may be displayed. The maps &c., when not in use, are rolled up and placed on hooks *o* carried by a frame *p*. The cross-bar is attached to a bar or tube *b*, provided at the lower end with a block *h*, Figs. 1 and 2, working in a slot *x* in the stand *a*. A pin projecting from the block *h* carries a washer b^1, Fig. 2, which is provided with a wedge-shaped projection working in connection with a recess formed in a handle *j*. The block also carries a pulley *k* to receive a weighted cord 3 which passes over pulleys *l* on the stand. The frame is elevated by the weight on the cord, and is lowered by depressing the arm of the handle *j*. To fix the map &c. at any height, pressure is applied to the arm 2 of the handle *j*, so that the block *h* is wedged to the sides of the slot. A wheel may replace the handle *j*, or the locking may be effected by a screw and washer, or by a ratchet and lever, or otherwise. In the modification shown in Fig. 6, the foot h^1 of the standard b^1 works in a slot x^1 in the stand a^{111}. A recess in the block h^1 contains a stud carrying a washer i^1 to which a handle j^1 is secured. The inner face of the washer has two wedge-shaped pieces which lie in the slot x^1 when the standard b^1 is free to slide up and down. The standard is locked by turning the handle j^1 so that the wedges, by acting against the front edges of the slot x^1, clamp the foot.

246. Mills, B. J. B., [*Siprell, D. W.*]. Jan. 22.

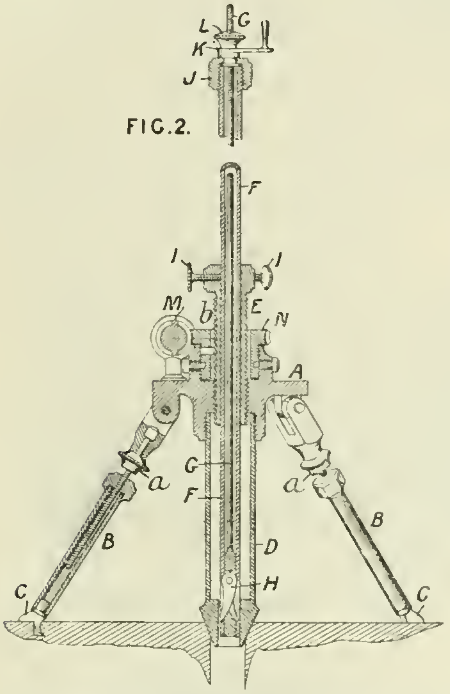


FIG.2.

Tripod stands.—The table A of a rock drill is supported by hinged legs B, which are adjusted by screws *a*, and have hooked feet C for securing the machine to the rock.

635. Tilley, W. Feb. 20.

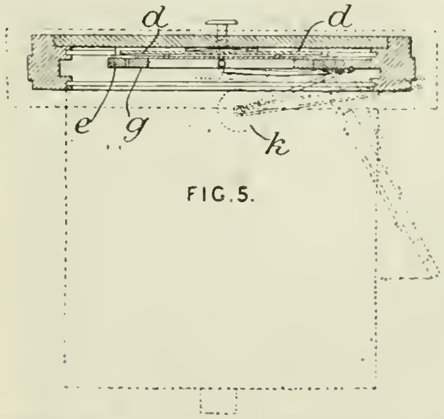
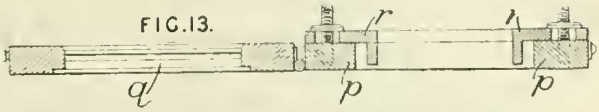


FIG.5.

Producing composite photographs; enlarging; printing.—Combination photographs are produced by first photographing the sitter in front of a dark background and then photographing a background upon the same plate by means of a positive immediately in front of the plate, the sitter still retaining his position and being thrown into darkness as far as possible by means of curtains above him and at the sides, and a white background being placed behind him. The positive of the background is carried in a frame *e* preferably hinged to the dark slide, as shown in Fig. 5. By means of the outside handle *k*, the background can be turned aside, as shown in dotted lines, or brought in front of the sensitized plate *d*. The frame *e* has an inner pivoted carrier *g* which is brought parallel to the plate *d* by coming in contact with it. A number of backgrounds may be mounted in carriers *g* to be placed in the frame *e* as required. For making an enlargement, the sitter is first taken with a white background. A mask is next made by shading the sitter, and a positive is obtained from the negative mask by contact printing. The portrait is then placed in the part *q* of the double frame shown in Fig. 13, and the mask in the carrier *r* on the part *p*. The frame being folded up, the carrier *r* is adjusted so that the position of the mask corresponds with that of the sitter. The frame is placed in front of the enlarging-lens and the portrait is first copied. Afterwards, the mask is brought into position and the background copied with it. This apparatus may be used for printing without enlargement.

FIG.13.



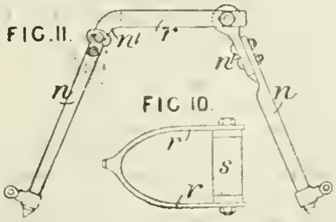
714. Brown, J. Feb. 26.

Photo-mechanical printing.—A film of bichromatized gelatine is exposed to light through an ordinary negative or a tracing, and is then treated with ammonia. The picture is thus produced either in relief or incised, and a printing-surface is obtained from it by electrotyping. Plates thus obtained may be used for the ornamenting of pottery, metallic surfaces, wood, leather, paper, textile or plastic substances.

900. Ellis, W. March 11.

FIG.11.

FIG 10.



Tripod stands.—A universal joint or strap is secured to the cradle of a machine for boring rock &c., and receives within it the horizontal shaft *s*, Fig. 10, which unites two of the legs *n*, Fig. 11, of a tripod stand. The legs of the stand may be lengthened telescopically, and may have the lower parts n removed so that the machine is supported on the short legs n^1. The fork r which unites the legs is large enough to admit of the machine being placed inside it for vertical working.

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937. Morgan - Brown, W., [*Hermages, J. H.*]. March 13. [*Provisional protection only.*]

Cameras; lens fittings; enlarging; tripod stands. —In order that a camera may be folded flat for transportation, the two sides and the top and bottom are formed of four pieces of wood joined together by hinges which exclude the light and extend the entire length of the pieces, the edges of each piece being bevelled. The camera is maintained rigidly in the unfolded position by the insertion of the lens board and the dark slide. The camera is secured by a screw inserted from the inside to a metal disc forming the head of a tripod, and provided with three horizontal pins and three vertical wings to which the legs are jointed. A wire having a suspended weight passes through a small central hole in the screw and disc to impart rigidity to the stand. The knob of the screw is used, when the camera is dismounted, as the knob of a walking-stick. The legs of the tripod are so shaped that, when closed, they form a complete circle. On the outside of the lens tube is formed a screw of large pitch engaging with a thread formed in the usual ring or washer so that the lens is focussed by rotation. When enlarging, the negative is placed on the ground-glass slide and exposed to light and, after placing the screen to receive the enlargement at the required distance, the lens is rotated until sufficient sharpness is obtained.

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966. Morgan-Brown, W., [*Hedden, H. M.*, and *Hill, C. A.*]. March 16.

Sensitized plates; enamelling.—Relates to the production of white plates other than those of porcelain, iron, or glass, and white surfaces for use in printing. A compound obtained by soaking guncotton in alcohol, adding more than enough ether to dissolve the guncotton, and shaking, is stirred with pulverized zinc oxide in a mortar until a creamy paste is obtained, and an additional quantity of the solution is then added. The compound produced is applied to a ferrotype plate having an elastic backing of baked linseed oil, or to other surfaces in the same manner that collodion is applied. After successively immersing the plate in soft and running water, it is immersed, while wet, in a sizing-solution obtained by dissolving sugar candy in mixed solutions of gelatine and arrowroot, and the plate is then removed and dried. According to the Provisional Specification, barium sulphate, kaolin, white clay, or other white pigment may be used instead of the zinc oxide, and, after treatment with the compound containing zinc oxide &c., the surfaces are prepared with albumen &c. mixed with sensitive preparations.

1266. Weyde, H. Vander. April 7.

FIG.1.

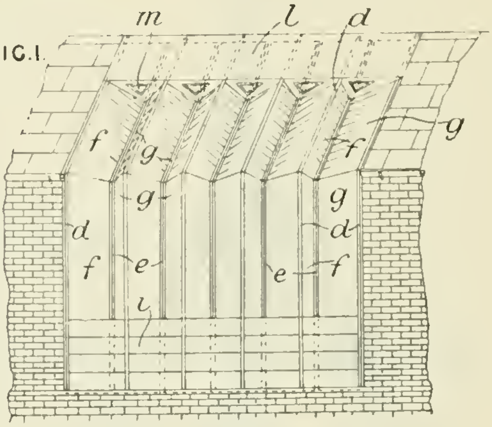
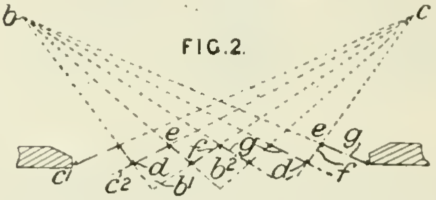


FIG.2.



Studios; lighting - arrangements. — A studio window is constructed so as to ensure sufficient lighting of the sitter and the partial or total exclusion from the studio of useless light. The light in passing to the sitter traverses the glass as nearly as possible at right-angles. Fig. 2 shows a horizontal section of the window. Two series of vertical panes of glass f, g are inclined to each other in such a manner as to face points b, c at opposite ends of the studio, while the window as a whole is in the same plane as the side of the room. The positions of the inner row of sash-bars e are found by drawing lines $b\ b^1$, $b\ b^2$, &c. and $c\ c^1$, $c\ c^2$, &c. through the points occupied by the outer sash-bars d, from the points b, c, at either of which the sitter is to be placed. The points e of intersection of these lines give the positions of the inner sash-bars. The series of panes which, for the time being, face the camera may be obscured by blinds or shutters. If the sitter is to be placed at one end of the studio, and the choice of the end occupied by the sitter is not required, the glass of one set of panes may be permanently darkened or replaced by boards or sheet metal. Fig. 1 shows a roof-light and side light. The horizontal beam at the eaves of the roof, which forms part of the framework in the ordinary construction, is dispensed with. The vertical sash-bars are fixed at the bottom to a sill, and at the top to the corresponding sash-bar of the roof. The outer and inner sash-bars, preferably of T-section, are placed with their webs inwards and outwards respectively. If the sill is near the floor, the lower part of the window may be boarded in, the boards *i* being, for the purpose of ventilation, fastened to the inner row of sashes so as to leave triangular-shaped spaces at the bottom of the glass which may be closed with the exception of apertures for the admission of air. The upper part of the roof-light is similarly boarded, the boards *l*, which may be covered with zinc, being laid on the outer row of sashes so as to leave apertures *m* for the exit of air.

1362. Edwards, E. April 15. [*Provisional protection only.*]

Photo-mechanical printing.—Relates to the use of gelatine, gum, albumen, fibrin, and equivalent plates for printing on paper and other fabrics by means of dies. The gelatine or other material and a bichromate are dissolved in hot water and spread over a plate of slate, wood, metal, glass, or other suitable substance. Parts of the plate, when dry, are rendered non-absorbent by exposure to light, and it is then used as a printing-surface. The desired colour in an aqueous solution is applied to the plate from which an impression is taken on paper or some other fabric. When the colours used require mordants to strengthen them, they and the mordants may be applied in any desired manner or order. A solution of proto-chloride of tin may be applied to the paper and a solution of extract of logwood to the plate. Aniline purple may be used as a dye with or without perchloride of tin. Chloride of cobalt may also be used but is visible only after the application of heat.

1663. Johnson, J. H., [*Soc. Anon. de Publications Periodiques*]. May 4.

Producing coloured photographs; photo-mechanical printing.—From a single negative a number of negatives are prepared for the different colours. The parts of each negative not required for the particular colour are blocked by rendering them opaque with a pencil, and the negatives are printed from in monochrome by the carbon process. The resulting pictures are developed while temporarily supported on stearine paper or metal coated with a fatty substance. The pictures are then mounted successively under water on the permanent support, each picture being dried and washed with benzene &c., to remove the fatty matter, before the next is applied. When all the pictures have been mounted, they are plunged into an alum bath and then washed and dried. Pictures may be printed by lithography, typography, or from engraved plates, in colours or with metals such as gold and silver, either before or after printing off one or more photographic impressions by the carbon process.

1699. Hare, G. May 7.

Change-boxes; dark slides.—A metallic shutter acted upon by springs is fitted in the body of the lid of a change-box, and has a long tail-piece working in parallel guides. The shutter is opened automatically by the springs when the camera slide is attached to the change-box for transferring the plate, and is closed by removing the slide. A flexible cover, which is made preferably of wooden laths glued to a band of leather or textile fabric, is used instead of the ordinary rigid sliding top and passes down into a well inside the box. The plates are inserted in the change-box from below. The end aperture of the dark slide used with this box is closed by a piece of metal or opaque material projecting from the back, which works on an axis at the further end. The back is fitted with a spring-catch lock and is so constructed that the aperture is closed and the plate is retained in position by applying pressure to the back. The plate is released and the end is thrown open by lifting a bolt.

1734. Tucker, J. B. May 10. [*Provisional protection only.*]

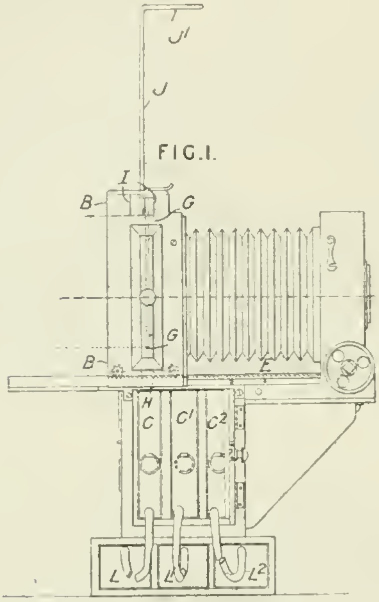
Mounting prints and the like.—Relates to the mounting of photographs &c. on zinc, iron, tin, or other metal plates. When mounting printed or other paper, both sides of the paper are coated with size, and the back of the paper, after drying, is attached to a metal plate previously coated with a mixture of copal varnish and lithographic varnish. The whole is subjected to pressure and is then dried in a stove or otherwise. The paper is afterwards coated with copal or other varnish, and the whole is finally stoved.

1777. Johnson, C. May 13. [*Provisional protection only.*]

Head-rests.—The rest is carried by a divided socket which surrounds a divided ball embracing the upright rod. By tightening a thumb-screw on the socket, the socket is made to grip the ball, and the ball, at the same time, is tightened on the rod. The vertical and angular adjustment can thus be effected simultaneously.

1791. Malfroy, A., [*David, J. B.*]. May 14.

Cameras; sensitized plates; developing; fixing; washing.—In order to dispense with the dark room, the plates are sensitized, developed, and fixed in a chamber below the camera. The plate G is clasped between jaws I on the arms J, united at J^1 to form a handle by means of which the plate can be lowered through the opening H. The back of the camera B is moved by means of racks E to bring the aperture H over the baths C, C^1, C^2, as required. The bath C contains silver nitrate for sensitizing the collodion film ; the bath C^1 has two compartments, one containing iron sulphate and the other water ; and the bath C^2 has likewise two compartments, one for sodium thiosulphate and the other for water for the final washing. To enable the development to be observed, the plate is raised into the camera, which is provided with apertures covered with yellow glass. The baths are filled and emptied by vessels L, L^1, L^2, which can be raised and lowered as required.



1825. Clark, A. M., [*Lambert, C. L.*]. May 17.

Printing ; masks and masking ; producing composite photographs.—The glass plate *a* of the printing-frame shown in Fig. 1 is covered with black paper with apertures *b*. The plates are held by the hinged frame *c* which has openings covered by masks. The masks have apertures coinciding with the apertures *b* but slightly smaller. The papers, which may be sensitized with chromium or silver salt, are cut to the required size, are placed in the openings in the frame *c* and are held by the flaps *d*. The frame for printing borders, shown in Fig. 3, is similar, but masks *m* are attached to the glass, to cover the pictures and expose the borders. The borders may be printed by means of a glass plate engraved, lithographed, or otherwise, or by means of a transparent film prepared as follows :—A glass plate is waxed and coated with collodion, which is dried and gelatinized ; a second coating of collodion is then applied, the film is stripped from the glass, and the requisite design printed, lithographed, or photographed upon it. Borders may be printed, by means of chromium salts or otherwise, around portraits or pictures in books or albums, or on screens.

FIG.1.

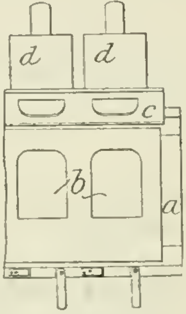
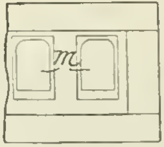


FIG.3.



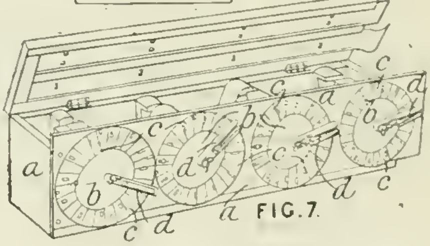
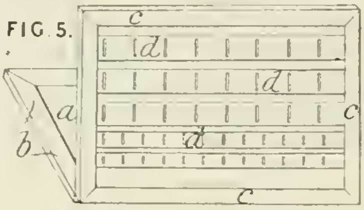


FIG.7.

FIG 5.



Cutting prints and the like.—Fig. 5 shows apparatus for cutting up sensitized paper for printing. The paper is placed on the glass plate *a*, which projects slightly above the frame *b*, and is held down by the frame *c*. The frame *c* carries bars *d* having slits to correspond with the compartments of the printing-frame.

Actinometers.—The box *a*, Fig. 7, is provided with one or more dials *b*, having ratchet teeth between which are holes *c* differently spaced. The index *d* has a spring latch, which can be set to engage in particular holes. A strip of paper is wound on the axis of the index, and by moving forward the index, the paper which has attained the tint indicated is caused as the index passes each notch to advance and expose another blank portion to be printed to form a new tint.

1863. Sabunjie, J. L. May 21. [*Provisional protection only.*]

Printing.—A printing-frame, consisting of a metal frame fitted with glass and provided with metal bars or clasps, which are hinged by one end to the frame, and are formed at the other end to clip the edge of the frame tightly, may be used for copying photographs or for printing from glass negatives. In a more simple form of the printing-apparatus, metal clasps are made to clip the glass without the aid of a metal frame.

1865. Morgan-Brown, W., [*Shuette, O.*]. May 21.

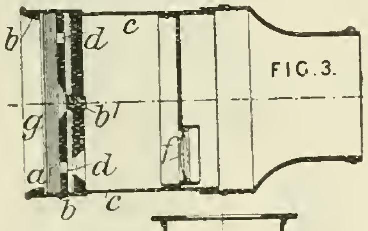


FIG. 3.

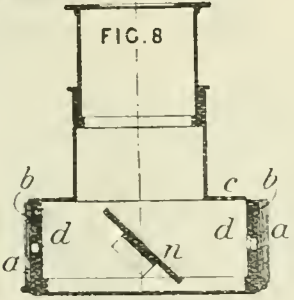


FIG. 8

Photometers.—Pocket instruments for measuring the intensity of light are each constructed with a number of discs or sheets of partially-transparent material which can be interposed between the eye and the light. Fig. 3 shows one form of apparatus. In a box *b* are formed a number of holes *d* arranged in a circle, behind which holes are a corresponding number of discs of paper *a*, parts of which are cut away in such a manner that, opposite each successive hole *d*, there will be an increasing number of thicknesses of paper, from 1, 2, &c. up to 20 or 60. At the back is a piece of ground glass *g*, and in each hole *d* is a piece of glass on which is a figure telling the number of thicknesses of paper behind; or the figures may be on the paper discs or on the box *b*. The box revolves on an axis b^1 in a case *c* provided with a focussing-lens *f*. In using the instrument, it is directed to the light to be measured, and the box *b* turned round until the number that can only just be seen is in the field of view. The ratio that this number bears to the full number of discs is the ratio of the intensity of the light to the standard light. Several modifications are described. In one, the lens *f* is placed in the centre of the case *c* and the axle b^1 is mounted eccentrically; in another form, shown in Fig. 8, paper bands *a* are placed on the circumference of the box *b* which is perforated with holes *d*, and the light is reflected along the axis of the case *c* by a mirror *n*. In another form, two cases constructed as shown in Fig. 3, are joined together so as to form a sort of opera-glass arrangement, the two boxes *b* being geared together.

1872. Bablon, V. May 21.

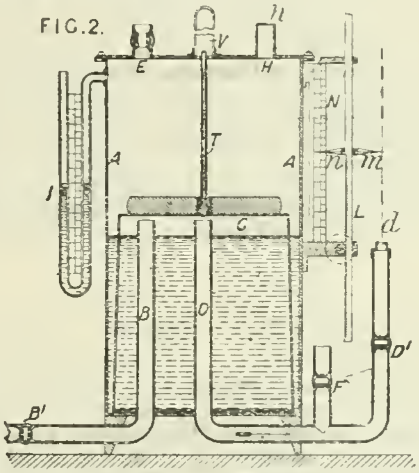


FIG. 2.

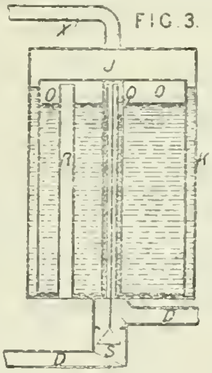


FIG. 3.

Photometers for measuring the illuminating power of gas according to the size of the flame. A constant flow of gas at a definite pressure is obtained by the apparatus and the visible size of the flame is taken as a measure of the intensity. In one form of apparatus, the gas is delivered by the tube B, Fig. 2, into a weighted bell C, which on rising, drives the air out of the surrounding vessel A through the cock E. When the bell is full, the taps B^1, E are closed and the tap D^1 of the burner pipe D is opened until the pressure of air in the receiver A, as shown by a manometer I, is at its specified point. Fresh air passes into the vessel A through a diaphragm *h* with an invariable orifice; the inflow of air and consequently the outflow of gas is thus constant. A rod T from the bell passes into a glass tube V, and indicates the amount of gas in the bell, which is made conical so that the pressure of gas due to the weight of the bell shall not vary. The bell C may be placed in an open vessel and connected to a second bell in a closed vessel. The height of the flame at the burner *d* is measured by a pointer *m*, *n* moved by a rack L over a scale N. When a fresh sample of gas is tested, it is run through the apparatus for some time, the gas passing out at the cock F. To bring the pressure to the same point without shifting the delivering cock D¹, the apparatus, shown in Fig. 3, is fitted into the delivery tube D. It consists of a vessel J connected by a tube X to the air vessel A, Fig. 2, and containing a double floating bell O, Q connected to a conical valve S. The outside part O of the double floating bell is connected by a tube R to the atmosphere, and the inside Q, which is of the same cross-sectional area as the valve S, is connected to the delivery tube D. When the pressure in the air vessel falls to the fixed amount, the bell O, Q will fall and open the valve S. Other forms of regulating apparatus for producing a constant flow of gas at a definite pressure, are described. In one, the bell C is supported by a cord running over a drum moved by clockwork. In this case a dry meter may be used, the clockwork being connected to a weighted piston. A gas meter fly may be used either driven or controlled by clockwork.

2011. West, T. J. June 2. [*Provisional protection only.*]

Photo-mechanical printing.—For the production of zinc blocks, a glass plate is coated with a solution of beeswax in ether, and, when dry, with a solution of gelatine or analogous substance to which has been added glycerine and bichromate of potash, tannin, or other hardening material. The film thus formed is removed when dry, and is mounted on a plate of metal or glass in a reversed position. A photographic design is then transferred to the surface. The film is then inked with lithographic transfer ink, and an impression is taken on transfer paper and transferred to a zinc plate which is treated with asphalt and rosin. The back and edges of the plate are coated with lac varnish. The plate is etched by being held under a vessel containing diluted nitric, sulphuric, or other corrosive acid. The bottom of the vessel is finely perforated, and above the bottom is a receiver for holding the fluid. A stop-cock in the receiver allows the fluid to fall in a fine shower on to the zinc plate which is thus etched to any desired depth. The plate after being cleaned and mounted is ready for the printing press.

2013. Edwards, E. June 2.

Tripod stands for rock drills. Fig. 7 shows a form in which the cylinder *b* slides between parallel bars *a* connected by frames *c*, *d*. The lower frame *d* is formed with a socket to receive the tube *g*, in which slides the adjustable leg *h*; *f* is an additional socket in which the tube *g* is placed when the drill is to be used in a horizontal position. The front leg may however, be pivoted to the frame, so that it can be adjusted at any angle. The back legs consist of a forked bracket *m* carried by bars *i* pivoted at *k*, tubes *n*, and adjustable bars *o*. The apparatus may be steadied by weights hung on the hook *r*. In the stand shown in Fig. 19 the front leg *g*, *h* is carried by a forked bracket *f*, the arms *e* of which are pivoted at *k* alongside the arms *i* carrying the bracket from which the other legs diverge. The arms *e*, *i* may be connected by stays. The frame *a* carrying the cylinder *b* can be swung outwards and secured in position by means of the curved stay *l*.

FIG. 7.

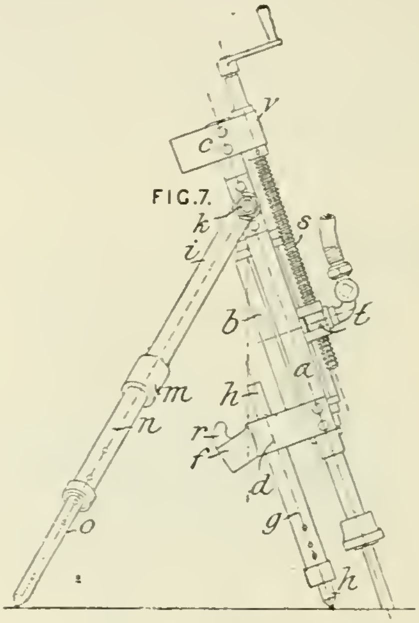
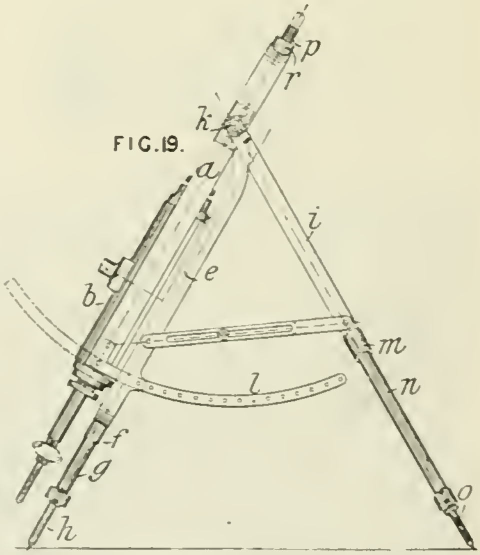
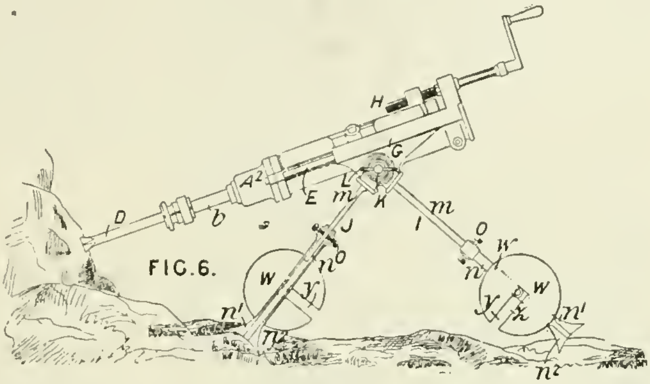


FIG. 19.



2287. Reynolds, G. H. June 23.

Tripod stands for rock drills. Two legs J of the tripod are mounted on squares on the spindle K, so that they move together. The third leg I turns on the spindle K, which can revolve in the frame body G. The parts have conical engaging-surfaces and are locked, after adjustment, by screws L at the ends. The legs have double feet n^1, n^2 to allow their positions to be reversed. The upper portion *m* of each leg is solid, and the lower portion *n* tubular. The locking-screw *o* bears on a tapering flat on the part *m*, so that, if the screw is slackened, the leg does not suddenly shorten to the full extent. The weights W, which steady the apparatus, are made with grooves *w*, *y* into which the legs *n* and cross-bars *z* enter to hold the weights in position.



2613. Dillon, T. A. July 22. [*Provisional protection only.*]

Photo-mechanical printing.—Relates to the embossing of thin metal plates to be used in the process of copying documents, drawings, &c. described in Specification No. 1935, A.D. 1874. Having obtained a negative by ordinary photographic methods, a print is produced on bichromated gelatine which is dried and laid on a hard smooth metal surface. The thin metal plate is placed on the gelatine film and covered by a sheet of lead, and the whole passed through a copper-plate or rolling-press to obtain an impression of the film on the thin plate. From these plates copies are made as described in the Specification referred to By another method, a sheet of paper prepared according to the method of the Ordnance Survey for photozincographic copying may be used. A transfer being made on the stone or zinc, fine resin is dusted on the greasy ink, and the surface is then treated with acid so that the letters or lines stand up in relief. Thin metal covered with lead is then laid upon this relief, and is indented as described above.

3059. Hughes, E. T., [*Hommel, A.*]. Aug. 31.

Producing photographs of special character; sensitized plates.—A clean glass plate is covered, on both sides, with a sensitized collodion film. When a copy of the object to be photographed is taken, in the camera, upon this plate, two images are produced, which are developed, fixed, and covered with a preserving varnish. The plate is printed from in the ordinary manner.

3334. Sugg, W. T. Sept. 24.

FIG.1.

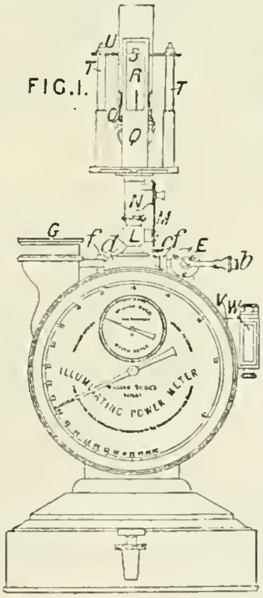
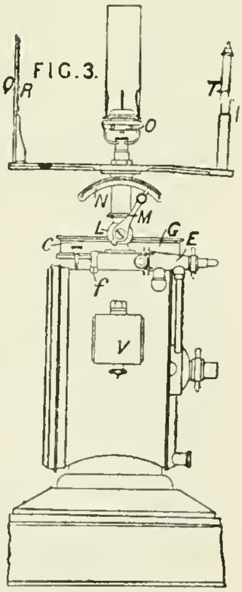


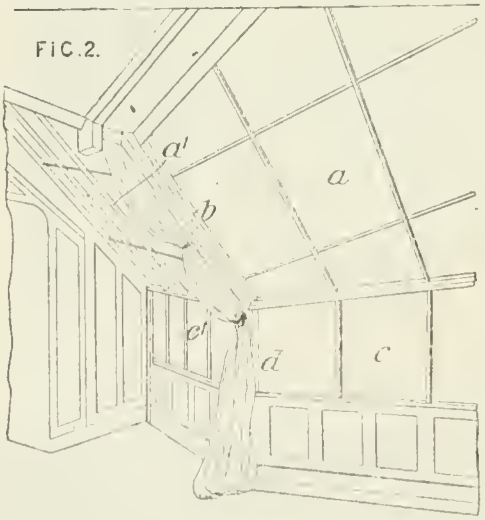
FIG.3.



Photometers.—The illuminating power of gas is obtained by apparatus which measures the number of cubic feet consumed in one minute in maintaining a visible flame of given height, and indicates on a dial the number of candles to which the gas is equivalent when burning at the rate of 5 cubic feet per hour. The apparatus is shown in front and side elevations in Figs. 1 and 3, and consists of a meter containing a clock, the hand of which makes one revolution per minute, and supporting an argand burner O and frame Q, which carries at one end a wire U stretched between pillars T, and at the opposite end a coloured-glass plate R having a mark S at the same height. On looking through the glass plate R, the top of the flame can be adjusted to the level of the mark S and wire U by means of a cock L with a pointer and handle M moving over a graduated arc N. The way through the cock is made in the form of a slot in order that the supply to the burner may be increased and diminished in the same proportion as the handle or cock is turned. The apparatus is also provided with two dry governors or regulators, contained in a box G, and a bye-pass E for conducting the gas directly to the governors and burner without passing through the meter. In using the apparatus, the gas is first passed to the burner without entering the meter, and the flame is adjusted to the proper height. The handle *b* of the cock E is then moved to admit the gas through the meter and the gas pointer allowed to rotate until vertical and at zero. The gas is then shut off from the meter. The position of the clock-hand is now noted, and the gas is allowed to flow through the meter for one minute, during which the clock-hand makes one revolution. The gas is then shut off again from the meter, the pointer indicating the illuminating power. The meter is fitted with a chamber having glass sides for indicating the water level, and is provided at the top with pillars *f* for receiving a spirit-level. The key *c* and stop *d* for the clock are also shown.

3352. Slingsby, R. Sept. 24.

FIG. 2.



Lighting - arrangements; studios.—An internal view of the side-light *c*, *c*¹ and the skylight *a*, *a*¹ of a studio is shown. The skylight slopes inwards or downwards from each end to the middle of its length and also downwards towards the eaves of the roof, and the side-light consists of two equal parts *c*, *c*¹ inclined to one another. The two parts of the side-light and the skylight may be divided by an unglazed portion *d*, *b*. Instead of being vertical, the side-light may slope outwards from top to bottom, or it may be inclined at the same angle as the skylight. A half skylight and side-light may be fitted to a studio in which the sitter is always placed at one end.

3453. Haddan, H. J., [*Edwards, E.*]. Oct. 5.

Photo-mechanical printing.—Gelatine, gum, albumen, fibrin, and equivalent plates are used for printing on paper and other fabrics by means of dyes. The gelatine or other material and a bichromate are dissolved in hot water and spread over a plate of slate, wood, metal, glass, or other suitable substance. Parts of the plate, when dry, are rendered non-absorbent by exposure to light, and it is then used as a printing-surface. The desired colour in an aqueous solution is applied to the plate, from which an impression is taken on paper or some other fabric. When the colours used require mordants to strengthen them, they and the mordants may be applied in any desired manner, or order. A solution of proto-chloride of tin may be applied to the paper and a solution of extract of logwood to the plate. Aniline purple may be used as a dye with or without perchloride of tin. Chloride of cobalt may also be used but is visible only after the application of heat.

3815. Taylor, T. L. Nov. 3. [*Provisional protection only.*]

Finishing.—Photographs are polished or burnished by passing them between a revolving cylinder and a burnishing bar having a motion in the direction of the axis of the cylinder. The cylinder is mounted in bearings which can be raised or lowered by means of set-screws. A piece of india-rubber is inserted at the back of the brasses or bearing-pieces, so that if the mount should be thicker than usual the cylinder will give slightly and the work will not be injured. The size of the cylinder is such that one turn will take the photograph through. The burnishing bar is mounted in a transverse slide, and moves across the photograph in one direction only so as to avoid any lines being formed on the photograph during its passage through the machine. The bar receives its endwise motion from a cam on the cylinder axle, and is returned by a spring.

3860. **Crookes, W.** Nov. 5.

FIG.12.

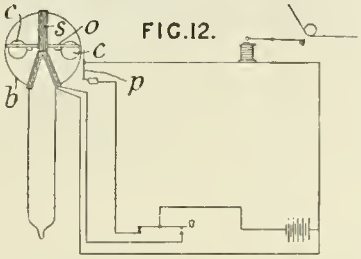
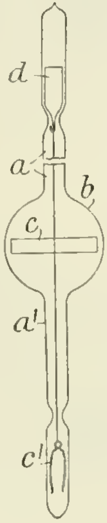


FIG.1.



Photometers. — Motion is obtained by light or other radiation falling on a surface which is freely suspended or balanced in a rarefied space ; the surface is then repelled. Rotation of a body is obtained under the same circumstances if the two ends of each surface are unequally acted upon by the radiation, a result obtained by coating the ends of the exposed surfaces alternately with lampblack. In one form of the instrument, a thin surface of pith, paper, mica, aluminium or other material, preferably a non-conductor of heat, and prepared with lampblack or otherwise, is attached to one end of a light beam, hung by a bifilar silk suspension. When radiation falls upon the pith surface, the deflection of the beam is proportional to the amount or intensity of the radiation. In another form, a rectangular bar c, Fig. 1, of pith or other material, is suspended in a glass bulb b by a fibre, which passes through glass tubes a, a^1, and is attached at the top to a hook on a glass plug d and at the bottom to a small weight c^1 in a second and smaller bulb in the tube a^1. The pith bar c is suitably coated with lampblack on the alternate halves of its surfaces. The bar in this case rotates until the torsion of the fibre balances the moment of the force due to the radiation. This instrument is adapted for use as a photometer by suspending a small vertical mirror and a small magnet with the pith bar, which is in this case blackened all over one end only and is at right-angles to the mirror. The mirror serves in conjunction with a lamp and horizontal scale to indicate deflections of the pith bar. The two sources of light to be compared are placed one facing each side of the bar, and are adjusted to distances from it such that the deflection produced by each acting alone, is the same, but in the opposite direction, to that produced by the other, or such that no deflection is produced when the two act at the same time. The intensity of radiation at the pith bar is then the same from each, and the comparative powers of the two sources can then be calculated. A control magnet in an adjustable holder may be mounted on the outside of the tube a, Fig. 1, and the tube a^1 may be dispensed with. Infra-red and ultra-violet radiations affect the pith bar, and may be stopped by screens, preferably glass cells containing an aqueous solution of alum and quinine bisulphate. Other rays may be cut off by the interposition of suitable screens. In another class of instrument, a large number of inclined vanes are mounted on an equal number of arms and are blackened only on their upper faces, so that the radiation falling vertically upon the instrument acts on all of the vanes to produce rotation. A similar vane-wheel may be mounted on a horizontal axis and is actuated by means of radiation falling upon it in a horizontal direction. In the photometric arrangement shown in Fig. 12, the vanes c revolve, and the attached magnet o moves a small external magnet p at each revolution so as to complete an electric circuit in which is placed a Morse recorder. The intensity of the light which falls upon the vanes c is proportional to the speed of rotation of the vane-wheel, which again is proportional to the number of dots made on any definite length of the paper strip in the recorder. The powers or intensities of two sources of radiation can thus be compared. An external coil s is provided round the bulb b to start the rotation of the vane-wheel when the radiation is slight.

4247. **Armanino, L.** Dec. 8. [*Provisional protection only.*]

Producing coloured photographs. — A print is rendered transparent by means of varnish &c., and is then mounted on a sheet painted or printed in colour ; or a print is printed directly on such a sheet.

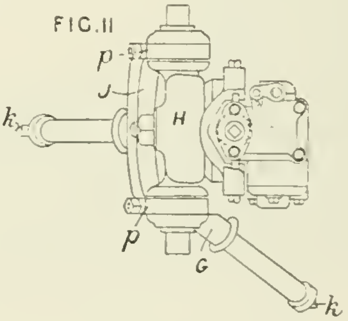
4552. **Bessemer, H.** Dec. 31. *Drawings to Specification.*

Lenses.—In the manufacture of lenses and reflectors, the general form and contour is given to discs or pieces of glass or speculum metal by turning in a lathe, the tool of which moves horizontally about a pivot coincident with the centre of the surface to be formed. The tool is fitted with a piece of black diamond, or other gem. The spherical figure given to the lens or reflector is perfected by grinding and polishing, and may also be figured to a parabolic curve in the ordinary way. In the manufacture of very large glass reflectors it is necessary to strengthen or support them so that they will not bend under their own weight. This may be done by fusing together any number of sheets of plate glass ; the plates are ground flat and covered with a wash of silicious and alkaline matters, *e.g.*, powdered glass, with or without boracic acid, pearlash, &c., and they are then put together in a "bung" and heated in a kiln. Or a single plate or sheet may be strengthened by a light strong cellular backing of metal &c., the faces of which may be formed with grooves placed in communication with an exhausted chamber so as hold the reflector in position by atmospheric pressure. To form reflectors with a deep curvature, discs of plate glass are bent in the glass bender's oven and the backings are made of proper shape to fit them. Reflecting or refracting surfaces may also be formed by turning successive annular rings or zones in the faces of discs of plate or other glass, such grooves or inclines being segments or portions of a sphere, parabola, cone, &c.

A.D. 1876.

408. Pass, E. de, [*Converse, M. D.*]. Feb. 2.

FIG.11



Tripod stands for rock drills. Two of the legs are screwed into pieces G, Fig. 11, which fit in conical recesses in an ordinary saddle H to which the back of the rock drill is bolted. The pieces are secured to the saddle by screws. The ends of a fork J attached to the third leg partly embrace the pieces G and are secured to them by bolts *p*. Each leg has a sliding foot adjusted by set-screws, and may be provided with weights.

1050. Clark, A. M., [*Brice, W. A.*]. March 10.

FIG.2.

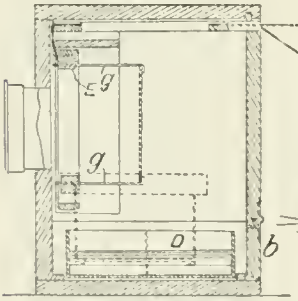
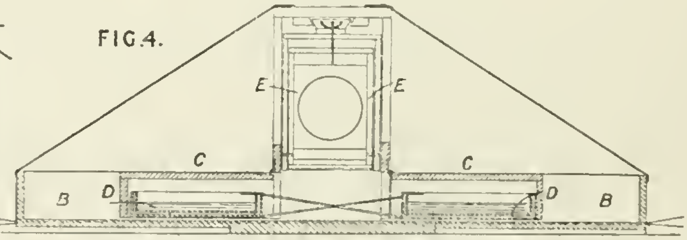


FIG.4.



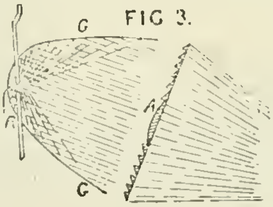
Cameras: sensitized plates; developing; washing. —The processes of sensitizing and developing are carried out in the camera by means of trays D which can be pulled into the centre by means of strings, or outwards under hinged covers C resting on shelves B. The shelves B are hinged to the camera, so that they can be folded up when out of use, and are supported, when in use, by cords. To take a photograph, a ground-glass plate is placed between the arms *g* on the frame E, and the object is focussed by moving the frame E from outside; the position of the frame E, as shown by an indicating-scale, is then noted. A plate coated with collodion is substituted for the ground-glass plate and the camera is closed. The tray D containing silver solution is moved to the centre of the camera, and the plate is lowered into it by manipulating cords attached to the frame E. When the plate has been in the bath for a sufficient time, the frame E is raised and then set back to the focussed position by means of the scale. After the exposure has been made, the plate is lowered into the developing-tray. When the development is finished, the plate is raised and the tray removed to one side. The door *b* at the back of the camera is then opened and a tray of water introduced for washing the plate, which is fixed and finished in the ordinary manner.

1148. **Henderson, A. L.** March 17.

Enamels; photo-mechanical printing.—The object is to produce photographs in vitrifiable pigments, which may be burnt in upon enamel tablets, porcelain, glass, or metal. If the enamel surface is light in colour, a transparency of the subject is treated with such iodides, bromides, or fluorides as will produce a dark image. The iodides &c. may be combined with stannic chloride, or other chlorides or mordants. Subsequently the picture may be submitted to the action of silicates, such as those of sodium or potassium, so as to convert the deposited metal into a silicate. The picture is transferred to the enamel, which is then fired so as to vitrify the silicate. The picture may be taken direct upon the enamel and treated with hydrofluoric acid, by which an intaglio is produced. This may be used as an engraved plate for printing, or it may be filled up with enamel colour and again fired. Instead of converting the image into a silicate, it may be fluxed by means of an emulsion containing borate of lead suspended in collodion, oil of spike, fat oil, or similar media. If the enamel is dark in colour, a negative is employed instead of a transparency, the iodides or bromides of the metals used being such as will produce a light image.

1747. **Weyde, H. Vander.** April 25.

FIG 3.



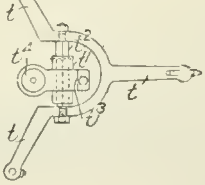
Lighting-arrangements. — A large lens is placed between the source of light and the object to be photographed, in order to render convergent the rays of light falling upon the object, and to produce a similar effect to that given by direct light from white sunlit clouds. An annular plano-convex Fresnel lens is preferred, but a water lens or other lens may be employed. In one instance, a reflector placed outside the studio reflects the vertical rays from the sky through a window on to the lens; in another instance, an electric or magnesium light is placed in the focus R of a paraboloidal reflector G, which reflects the rays on to the lens A in a parallel direction. A sheet of tissue paper or ground glass may be placed between the source of light and the lens, so as to soften the light. The lens may be made by casting the glass in moulds, and afterwards submitting the angular surface to the direct action of a furnace until the surface runs and becomes smooth and glossy. Each annulus of which the lens is composed may be cast in segments and joined together.

1991. **Sarony, O.** May 11.

Producing photographs of special character; dark slides; masking; lens fittings. — Fancy borders, titles, or other devices beneath or round photographic pictures are produced on the same negative as the picture by successively exposing different parts of the plate through different openings. The two openings may be contained in a sliding frame fitted to the plate holder, or they may be contained in separate frames hinged or pivoted within the camera. When a single portrait is produced, one of the openings corresponds in size to the desired picture, and the other opening, which is fitted with colourless glass, having a mask corresponding in size, shape, and position to the first opening, is of sufficient size to include the border and the picture. The device to be produced beneath or round the picture is formed on the clear portion of the plate. The sensitized plate is first exposed through the first opening. The cap is then placed on the lens, and the second opening is substituted for the first. A cap consisting of a tube having an outer covering of tissue paper at one end and a piece of ground glass inserted within it behind the tissue paper is substituted for the ordinary cap in order to equalize the light and to shut out exterior objects during the exposure of the border. When more than one portrait is required, and a sliding frame for containing the openings is employed, the usual "slide back" camera is used, and the sliding frame is fitted in a groove on the plate holder. In order that the frames, when hinged, may be brought near to and parallel with the sensitized plate, the frames are attached to their pivots by curved arms and are provided with small stops to prevent them from actually touching the plate. The pivots of the frames extend through the top of the camera, and are provided with milled heads for turning the frames against the sides of the camera or against the sensitized plate.

2208. **Dunn, W. W.** May 25.

FIG.10



Tripod stands for rock drills. The stand has three adjustable legs *t*. The square cross-bar t^2 carries a round boss t^1, on which is secured the socket t^4 by means of the clamp t^3. The socket t^4 receives a trunnion on the drilling-machine.

2274. Burrows, F. T., and **Colton, J. D.** May 30.

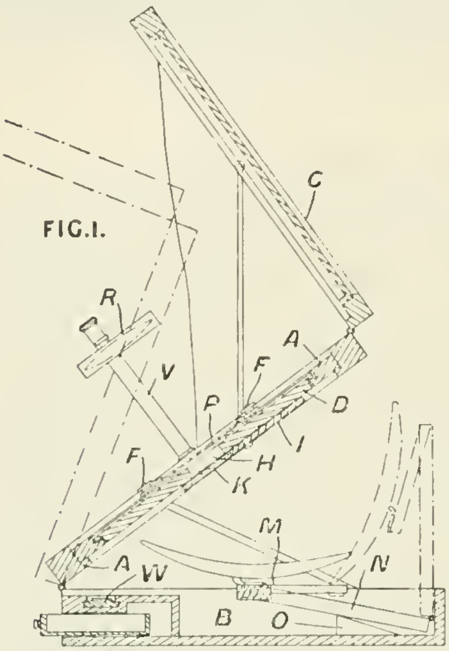
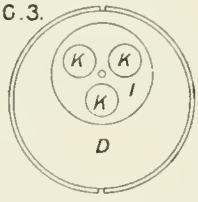


FIG.3.



Retouching.—The desk A and lid C are hinged together, and are supported, when raised from the box B, by struts. The negative is secured by clamps F to the disc D, which can be turned round as required. The disc I, pivoted at the back of the disc D, carries a series of graduated screens K, Fig. 3, any one of which can be brought opposite the opening H. The screens K are used to conceal minor imperfections in the negative, when it is desired to deal with the grosser defects only. A concave reflector is supported by the T-shaped frame M and bars N adjusted by the wedge O ; for night use, it is turned to the vertical position, and a plate of violet glass is placed in the recess P to cut off yellow rays from the lamp. The magnifying-glass R is adjustably mounted in an arm clamped to the standard V. A pencil sharpener is provided, consisting of a block W on which a piece of emery paper is clamped.

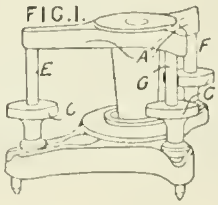
2349. Tuck, R. June 5. [*Provisional protection only.*]

Mounting prints.—A pressing-roller is made of wood, india-rubber, gutta-percha, or other suitable material, and is mounted on an axle or pins in a metal, wood, or other frame provided with a handle. The roller is preferably covered with vulcanized india-rubber.

2367. Brown, R., and **Barnes, R. W.** June 6.

Producing photographs of special character.—A mezzotint effect is produced in vignette portraits. A stippled granular effect is produced direct, in the process of printing, from a groundwork of morocco leather or other reticulated surface. The print is treated by the artist with crayon or pastel, and an effect produced according to taste, and from the prepared print a second negative is taken. A mask cut from the vignette is placed on the second negative or on a negative of the reticulated surface, and only the lighter and inner outlines of the photograph are fastened down, the outer vignetted portion of the figure being curled or turned over in a graduated manner. The prepared negative and mask is then placed on the vignetted photograph, and the whole combination placed on a revolving table and exposed to the action of daylight until the granular effect, with or without the background, is printed on the vignetted surface, after which the photograph is fixed and completed in the usual manner.

2697. Adie, P. June 30.



Tripod stands for astronomical and surveying instruments. The three levelling-screws E, F, G are fixed to the tribrach A instead of working through it, and are adjusted by screw sockets C which are formed with ball heads resting in V-grooves in a tripod or frame underneath. A locking-plate prevents the lower ends of the sockets from falling out of the grooves.

2963. Brookes, A. G., [*Farjon, C. E.*]. July 21.

Embossing photographs.—A press in which the distance between the travelling plate and the base is easily adjusted, is applicable for stamping or embossing photographs. In the form shown in Fig. 1, the travelling plate is connected to the base-plate by screw bolts *a*, *a*, one of which may be right-handed and the other left-handed. The bolts pass freely through the travelling plate and are screwed into holes in bosses on the base-plate. Each bolt has a head and an actuating-handle which can be turned outwards or inwards. The travelling plate is raised, when the bolts are unscrewed, by coiled springs which surround the bolts. In a modification shown in Fig. 3, the screw bolts do not rotate. To the head of each there is pivoted an actuating-handle carrying an eccentric or cam-shaped boss which bears against the upper surface of the travelling plate. In another modification, shown in Fig. 5, screwed sockets *h* turn freely in holes in the travelling plate and have flanges which bear upon the upper face of the plate. The bolts engage the sockets and move freely in holes in the base-plate. At the lower end of each bolt there is an eye or ring through which passes a rocking shaft k. On this shaft is a cam l bearing on the under face of the bed-plate, so that, when the shaft is rocked by a hand-lever, the travelling plate is moved up or down. When used to emboss photographs, an oval opening is cut in the travelling plate to allow the cardboard to bulge out.

FIG.3.

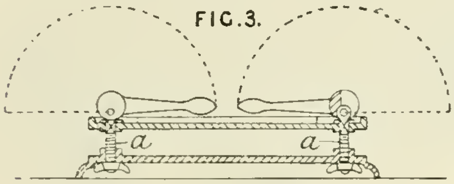


FIG.1.

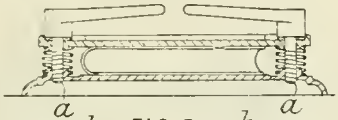
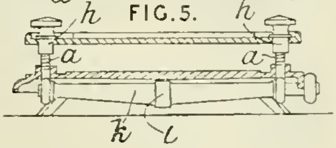


FIG.5.



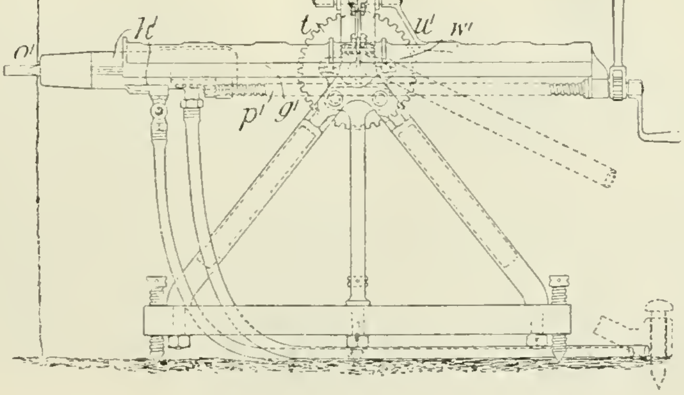
2973. Morgan-Brown, W., [*Duhauron, L. D.*]. July 22.

Producing coloured photographs; cameras; sensitized plates.—In a process of photography in colours, three negatives of the same object are taken, one by green light, another by orange light, and the third by violet light. Three positives or monochromes are printed from these negatives on gelatinized semi-transparent paper prepared with the complementary colours, and the three semi-transparent monochromes, being superposed, represent, by the blending of the tints, the total colour of the object. A triple camera containing three lenses may be used to obtain the negatives. Images are simultaneously directed to the three lenses by reflection and refraction, unsilvered reflecting-glasses being employed. A concave correcting-lens is placed between the object lens and the sensitive surface, very near to the latter. Coloured glasses for qualifying the light for each negative are placed close to the sensitive plate, or they may be placed immediately outside the object lens; they are tinted with coloured varnishes. When wet processes are employed, aurine or eosine is used in sensitizing the plate for green light, and chlorophyll that for orange light.

3152. Cowper, E. A. Aug. 9.

Tripod stands for coal cutters. A cradle g, Fig. 3, on which the drill cylinder h of a percussive rock drill for cutting horizontal grooves in coal is mounted, is pivoted to the rear leg c of a tripod stand so that the cradle may be moved from side to side. The legs a, b, c of the tripod consist preferably of wrought-iron tubes having solid ends united by welding, screwing, or other means, and are connected near the base by tie-rods d, e, f. The tripod stand is secured in position by three pointed screws at the corners of the base of the stand and by a screw z passing vertically through the apex of the stand and forced against the roof by turning the screw by means of a hand-wheel. When the roof is too high, the screw z bears

FIG.4.



against a lever, the front end of which is inserted in the face of the coal and the rear end is weighted by sand bags, coal, or other weights; or levers having their front ends inserted in the face of the coal and their back ends weighted press upon hooks or lugs at the front of the frame, the back corner of the stand being in this case kept down by weights laid on bars hooked on the frame and on the levers. When the rock drill is used for cutting vertical grooves, the top of the tripod is provided with a socket for the reception of a movable hollow post w, Fig. 4, fitted at its upper end with a screw x, the pointed end of which is forced against the roof. In another method of fixing the tripod, lugs w^1 are formed at the top of the tripod for the reception of a movable strut extending backwards and provided with a pin which can be driven into the floor of the working. A lever which is inserted at one end into the coal and is weighted at the other end bears on the tripod just below a trunnion on the cradle, or two similar levers press down on the side of the bottom of the frame in order to secure the tripod.

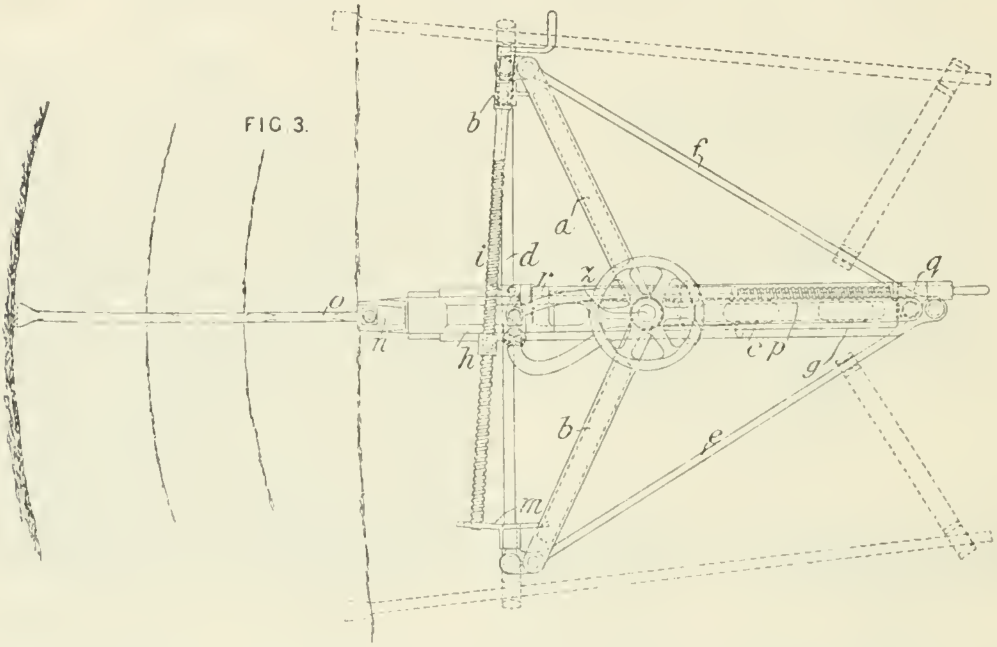


FIG. 3.

3298. Johnson, J. H., [*Charbonnier, M.*, and *Charbonnier, R.*]. Aug. 22.

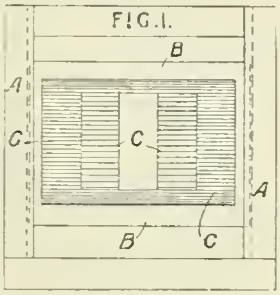
Ornamenting by photography.—Relates to a photographic and transfer process for ornamenting glass or glazed or enamelled articles, such as glazed crockery-ware, porcelain, pottery, glass plates, and glass hollow-ware products in the biscuit condition, which are to be coated with a transparent glaze. A clean polished copper plate is coated uniformly with an aqueous mixture of bichromate of potash and honey or sugar, by means of a small turning-board or centrifugal machine. The plate thus sensitized is then exposed under a glass positive or through a transparent paper picture, photograph, engraving, lithograph, or drawing, the paper being kept from sticking to the plate by glazing the paper, or covering it with a varnish, or by placing the paper between thin sheets of glass. The plate is then developed by dusting it, by means of a brush, with vitrifiable powder or colouring-enamel consisting of metallic oxides and fluxes. The plate is then treated with collodion and washed in water until the coloured coating of bichromate of potash is removed, the picture which remains being formed only by the powder. The picture adhering to the collodion is then transferred to the enamelled or glazed part of the article by a soft frame of thin cardboard, caoutchouc, gutta percha, or thin wood. The picture is then dried in the open air or at a fire, and treated with oil of petroleum. The article is then baked. The vitrifiable colours may be replaced by charcoal powder covered with a gelatine varnish. In applying the pictures to products in the biscuit condition, the glaze is applied immediately, otherwise the picture requires to be treated with petroleum mixed with a siccative.

3374. McLiesh, W. Aug. 28. [*Provisional protection only.*]

Lenses.—Pictures "in stereoscopic or natural "relief" are obtained by employing lenses with a short focus, "the margin of the lens forming a "parallax corresponding to the distance between "the human eyes." The diaphragm is placed so as not to cut off the marginal rays. The lenses are from two to four inches in diameter, and the focal length of the back lens is from one to three times the diameter of the front lens. Any form of lens or combination of lenses, except the ordinary portrait lens, may be employed.

3417. Brice, W. A. Aug. 30.

Actinometers. — An actinometer for attachment to a camera consists of a wooden frame A provided with a sliding glass plate B, to one face of which are fixed plates or sheets C of transparent material. The centre of the glass plate is left clear, and the number of superposed layers of plates C increases in regular succession towards the end of the plate B so as to afford a greater obstacle to the passage of light. The actinometer is set up by means of hinges and hooks or screws between the lens and a sensitized plate, and a photograph is taken in the usual manner. The condition of the various sections of the picture, after being developed, indicates the quality of the chemicals, lens, and light employed.

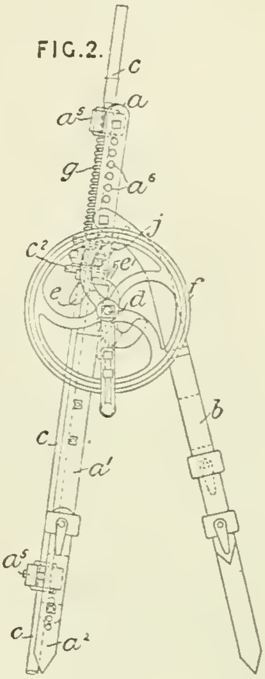


3644. Nesbitt, G. Sept 18. [*Provisional protection only.*]

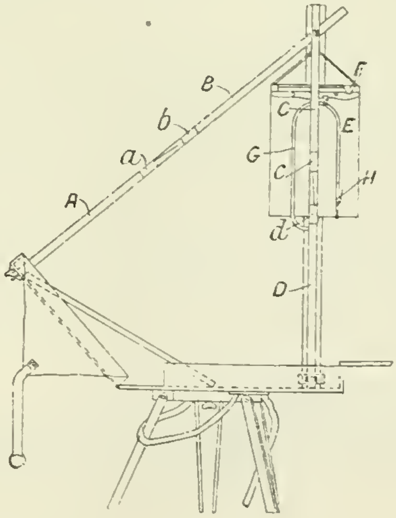
Printing.—Apparatus for printing or for giving a border to a photograph consists of a frame having a hinged back of the same size as the photograph to be printed. The frame is formed with a rabbet for the reception of the printing-plate, and with a groove in front of the rabbet for the reception of a glass having a mask for covering the parts of the portrait to be printed, a separate glass with a different mask being used for each shape of portrait. The hinged back is opened to allow the insertion of the portrait, which is forced against the printing-plate by the hinged back.

3741. Neumann, G. H., [*Weaver, W.*]. Sept. 25.

Tripod stands for rock drills. The frame of a drill is mounted on three legs a^2, b, the front legs a^2 being extensions of the side bars a^1 of the frame, to which they are secured by screws. The leg b is forked at its upper end and is pivoted to the side bars a^1. The length of the leg may be adjusted by screws.



4060. Gedge, W. E., [*Terpereau, J. A.*]. Oct. 20.



Developing-tents.—The box is small, and a curtain composed of three pieces is nailed upon the sides of the box so as to form a chamber, a window of glazed linen being provided in one of the panels or pieces. The curtains are held by an arrangement of rods in two parts A B, C D, at each end of which are two pieces of tin or other suitable material a b, c d, into which the ends of the rods enter. An india-rubber bag E provided with a funnel F contains water, and the pipe G for letting out the water is provided at its end with a self-closing stopper H. When in use, the bag E is hooked on to one of the uprights so that the water may come directly into the basin placed in the middle of the box. The apparatus is supported on a tripod.

4117. Newton, H. E., [*Rousseau, C.*]. Oct. 24.

Colouring; mounting prints.—A carbon print of an object to be reproduced is mounted on a temporary supporting-paper in a reversed position and is tinted with oil colours. When the colours are dry, the picture is coated with an adhesive substance and transferred to a canvas or other permanent backing, and the supporting-paper which still covers the face of the carbon print is then removed. The paper for temporarily supporting the carbon print may be prepared with stearin, alcohol, and resin, or with caoutchouc dissolved in benzine.

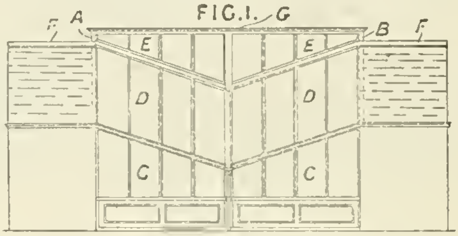
4344. Donisthorpe, W. Nov. 9. [*Provisional protection only.*]

Kinematographic apparatus.—Pictures are taken at equal intervals of time, to record changes taking place in, or movements of, the object photographed. By a succession of pictures, so taken, the eye may be impressed with a representation of the object in continuous movement. The camera is constructed to receive a number of prepared plates, one behind the other. By mechanism, the series of plates moves forward progressively, so that as soon as the foremost plate has been exposed for the required length of time, the whole series moves forward a certain distance; the foremost plate is then dropped into a receiver. The next plate is then exposed and dropped, and so on. The admission of light to the lens is controlled by a movable screen, which is brought in front of the lens during the shifting of the plates The apparatus may be used in conjunction with microscopes or telescopes. The plates are developed and printed from in the ordinary manner. A series of them may be printed on a paper strip to be viewed in a zoetrope or the like.

4385. Slingsby, R. Nov. 11.

Lighting-arrangements; studios.—In a modification of the invention described in Specification No. 3352, A.D. 1875, the photographic studio is provided with a vertical light E having a double inward pitch at the centre corresponding to that of the skylight D and side lights C. This vertical light meets the highest part of the skylight, and rises to, or slightly above, the ridge F of the roof of the studio. The upper edge of the skylight is in two oblique lines parallel or nearly parallel to the lower edge of the eaves of the roof, so that the area of the skylight is increased. The vertical light and the intervening flat portion of the roof may be carried by a trussed girder G supported by principals A, B.

FIG. 1.



4473. Syré, A. Nov. 18.

FIG. 7.

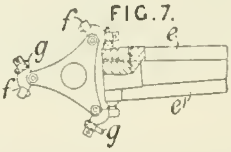
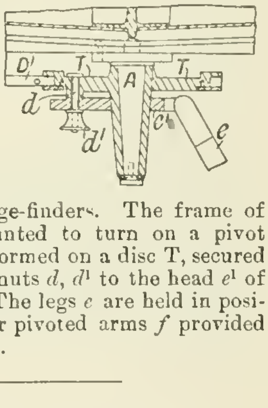


FIG. 1.



Tripod stands for range-finders. The frame of the range-finder is mounted to turn on a pivot A, working in a socket formed on a disc T, secured by T-headed bolts and nuts d, d^1 to the head e^1 of the tripod stand e, e^1. The legs e are held in position between jointed or pivoted arms f provided with tightening screws g.

5065. Wilkinson, J., Hardman, J., and **Birtwistle, R.** Dec. 30. [*Provisional protection only.*]

Finishing.—In order to burnish photographs, they are passed, when mounted on paper or cardboard, between a pair of heated metal rollers. The rollers are mounted in adjustable bearings and are geared together, the lower one being rotated by a handle. Each roller is heated by steam or by gas supplied to a perforated pipe passing into the roller.

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